

International Abstract of Surgery

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INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1933

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

HEAD

Lucchese, G: Experimental Studies on Tuberculous of the Salivary Glands (Ricerche sperimentali sulla tubercolosi delle ghiandole salivari) *Clin chir* 1932 VIII 1366.

The author produced tuberculosis of the parotid gland in rabbits by injecting a broth culture of human tubercle bacilli. In one group of rabbits the injection was made directly into the gland and in another into the carotid artery. The lesions produced in the two groups were fundamentally the same. They consisted essentially of a marked histocyte reaction with the presence of tubercles, giant cells and tubercle bacilli, an abundant connective tissue infiltration which destroyed and replaced the lobuli of the glands, a tendency toward cicatricial sclerosis and, occasionally, caseation. The morbid process occurred most frequently in the immediate vicinity of the glandular tubules and excretory ducts and from there seemed to spread across the interlobular septa following the lymphatics.

The author's findings are not contrary to the accepted theory of an ascending or canalicular infection, as the same lesions were produced when these paths of infection were definitely excluded. Lucchese is of the opinion that in man infection of the gland by tubercle bacilli takes place usually through the blood stream and occasionally through the lymph stream, but that the spread of the infection through the salivary gland occurs by way of the lymphatics.

EDWARD T. LEVY, M.D.

EYE

Blair, V. P. Repairs and Adjustments of the Eyelids. *J Am Med Ass.*, 1932 XCIX 2171.

To restore function or correct the appearance of a damaged eyelid not only the anatomy and contour of the lid must be considered but also the structures that give it support and those that are in continuity. A neighboring distortion can damage or hamper the

movements of an intrinsically normal lid or if unrecognized can compromise the result of operation.

To determine before operation the amount of tissue that will be needed it is necessary to measure the defect, add to this measurement the estimated retraction of all remaining normal tissue when it is released and allowed to return to its natural relationships and allow for contraction after the repair. For a split skin graft applied in a lid the allowance for contraction should be about 60 per cent.

If only skin has been lost, only skin should be substituted, not skin and fat. This is important. Whether to use a full thickness or a split graft will depend on the needs and possibilities in the given case. Less contracture occurs under a full thickness graft than under a split graft. However, the split skin graft is more certain to take and requires a shorter period of postoperative care. If it is applied over a wax form, the lid can usually be stretched sufficiently to allow for 60 per cent contraction. Furthermore, when needed, this type of graft can be applied to cover the lid defect and also an adjacent area of indefinite size.

Because of its bulk, a pedicle flap carrying skin and subcutaneous tissue is not suitable for surfacing the orbicularis muscle, but such a flap may be absolutely necessary when the loss is greater than skin depth.

Dragging of the lid downward by paralysis of the cheek can be relieved somewhat by supporting the tissues of the face with strips of fascia lata, but when the dragging is due to a scar from a loss in the cheek repair of the cheek is indicated.

If the lid is drawn down by the loss or displacement of the orbital border, it may be raised by building up this bony ridge with a piece of costal cartilage after dividing the lower attachment of the palpebral fascia. If the border is simply depressed as the result of a recent fracture, it can be pried upward either from within the antrum or by hook or chisel inserted through the skin.

When the separation of the lid from the globe is due to an enophthalmos, but the globe is not fixed in

the depth of the orbit, the globe can be brought forward by inserting cartilage deeply at the periphery of the orbit. If the globe cannot be experimentally brought forward by injecting physiological solution of sodium chloride into the depth of the orbit, the lids may be allowed to move back a certain amount by taking away some of the outer border and adjacent orbital wall.

Paralysis or damage of the levator palpebrae causes a droop of the upper lid which is best corrected by connecting the tarsus to the occipitofrontalis muscle by a loop of live autogenous tendon.

The article contains seventeen illustrations of the procedures discussed. JAMES B. BROWN, M.D.

Rodriguez, A.: Cataract Resorption (*Zur Katarakt Resorption*). *Semin. Vestn. Oftalm.* 1932 1, 1.

The nature of the forces bringing about the resorption of cataract masses has not been definitely determined. The author reports attempts made to work out a surer method of producing cataracts experimentally in the eyes of rabbits and to gain a more intimate knowledge of the resorbing forces. Cataracts produced by the injection of adrenalin and sodium chloride solution into the lens were not stable and cleared up after a time. On the other hand, an 8 per cent solution of magnesium chloride was found to produce permanent cataracts which did not clear up. From 0.1 to 0.3 c.c.m. of this solution mixed with an equal quantity of aqueous humor was injected through the middle of the cornea into the lens. In thirty-five rabbits a single injection produced a total cataract and in six rabbits it produced a partial cataract which was permanent and in some instances persisted without change for three years. Weaker solutions of magnesium chloride did not yield definite results so far as permanency of the cataract was concerned.

In an investigation of the biological characteristics of the aqueous humor Rodriguez first studied the cytological characteristics of the normal aqueous humor and then those of the aqueous humor in cataractous eyes. Cellular elements were found in the aqueous humor of only four of fifty normal eyes. Most of them were lymphocytes. In the entire smear of the centrifuged sediment of the normal aqueous humor in these four cases only one or two lymphocytes and very rarely a single polymorphonuclear or squamous epithelial cell could be found. As a rule the normal aqueous humor was free from cells. The vitreous humor of the normal eyes was also found to be cell free. In the eyes with cataract, especially those with rapid absorption of the cataract, the microscopic picture of the aqueous humor was very different, showing many lymphocytes and often quite numerous phagocytic and neutrophilic cells. The neutrophilic cells were less numerous than the phagocytic cells and did not take part in the phagocytosis. Frequently the blood cells had penetrated directly into the lens. The entrance of the cells into the aqueous humor and the phagocytosis were most clearly seen during the period of

most active resorption of the cataract masses and decreased gradually with cessation of the resorption. In the cases in which the cataract was not resorbed, but remained stable, the aqueous humor was free from cells just as in the normal eyes.

In order to determine whether the resorption of the cataract occurred only by phagocytosis or whether fermentative processes also played a part in the process the author carried out investigations to determine whether proteolytic and amylolytic ferments are present in the aqueous humor of normal and cataractous eyes of rabbits. The tests for proteolytic ferments was carried out with a few modifications, by the Gross-Fuld-Michaëlis method. In thirteen tests, from 0.02 to 0.04 c.c.m. of proteolytic ferment was found in the aqueous humor of the normal eye. At a temperature of 14 degrees C. as little as 0.06 c.c.m. of the aqueous humor had a proteolytic action. This action could be increased by heating the ferment. After the ferment it had been kept at a temperature of 38 degrees C. for a period of one hour 0.04 c.c.m. of aqueous humor was sufficient to produce the proteolytic action produced by 0.06 c.c.m. of aqueous humor at a temperature of 14 degrees C. The ferment content of the normal aqueous humor was the same in different rabbits and was constant. In contrast, the resorption process in eyes with cataract increased the protease content of the aqueous humor as compared with that of the normal eye twofold and often even fourfold. If it was necessary to use 0.06 c.c.m. of normal aqueous humor kept at a temperature of 14 degrees C. and 0.04 c.c.m. of normal aqueous humor kept at a temperature of 38 degrees C. for an hour to bring about the digestion of 0.5 c.c.m. of a 0.1 per cent solution of casein, only 0.02 c.c.m. and 0.01 c.c.m. respectively of the aqueous humor of eyes with resorbing cataracts were required to bring about the same action under similar conditions. Therefore the aqueous humor of cataractous eyes contained three and four times as much protease as the aqueous humor of normal eyes. The protease of the aqueous humor remained quantitatively parallel with the resorption of the cataract. With the cessation of resorption, the fermentative activity of the aqueous humor fell to normal. The aqueous humor of eyes with inactive cataracts showed either normal or almost normal values.

The presence of the amylolytic ferment, diastase, in the aqueous humor in normal and cataractous eyes was determined from the fermentation of a 1 per cent starch solution to which the aqueous humor was added. The conversion of the starch was determined qualitatively by the methods of Wohlgemuth and Trommer and quantitatively by the Hagedorn-Jensen method. Twelve fermentation tests showed that at a temperature of 14 degrees C., normal aqueous humor had no power to convert starch, but that after it had been heated to 38 degrees C. for an hour it acquired this power. At a temperature of 38 degrees C., 1 c.c.m. of normal aqueous humor was able to convert 20 c.c.m.

of a 1 per cent starch solution. The aqueous humor of cataractous eyes and especially of those with stormy progressive resorption, was richer in diastase than the aqueous humor of normal eyes. The aqueous humor of eyes with a stable, inactive cataract showed an almost normal diastase content.

In ten normal rabbit eyes, the sugar content of the aqueous humor ranged from 0.036 to 0.093 per cent and averaged 0.063 per cent.

Finally the author made a micro-anatomical examination of four eyes with gelatinous eight with slowly resorbing, and six with stable cataracts. These also demonstrated the phagocytic and fermentative resorption of the cataract and its substances. During the resorption the posterior chamber and the lens contained numerous cells which apparently had wandered out from the ciliary processes. The capsule of the lens was attacked, thinned out and destroyed first in the equatorial portions. A lysis and phagocytosis of the cataract occurred. The iris did not take part in providing the lytic and phagocytic agents. The latter apparently had their origin only in the ciliary processes.

[UENSLER (O)]

Woods, A. C., and Little M. F.: Uveal Pigments: Hypersensitivity and Therapeutics. *Arch Ophth.*, 1933 12, 200.

The authors group the pathological conditions in cases studied by them as follows

Group 1. Uveitis due to constitutional causes. No history of injury

Group 2. Non penetrating wounds of the eye traumatic uveitis no sympathetic disturbance

Group 3. Operation involving the uveal tract uneventful recovery

Group 4. Operation involving the uveal tract eyes operated upon lost because of postoperative infection no sympathetic disturbance

Group 5. Endophthalmitis phaco-anaphylactica.

Group 6. Penetrating wounds of the eye involving the uveal tract recovery without enucleation or the development of sympathetic disease.

Group 7. Penetrating wounds of the eye involving the uveal tract injury and clinical course necessitating enucleation of the injured eye no pathological or clinical evidence of sympathetic ophthalmia.

Group 8. Delayed non-infectious postoperative uveitis.

Group 9. Sympathetic ophthalmia. (a) patients not receiving pigment therapy, (b) patients receiving pigment therapy

One hundred and fifty three patients with various conditions were subjected to the intracutaneous pigment test. Thirty-two of the tests were positive and 121 were negative. Hypersensitivity to uveal pigment was noted only after penetrating wounds of the eye. In general, the development of hypersensitivity appeared to indicate a grave prognosis. Only 1 patient with a frank pigment hypersensitivity showed normal healing. One group of patients

appeared to present a new clinical entity the development of a delayed non infectious recurrent and chronic postoperative or traumatic uveitis associated with allergy to pigment. In sympathetic ophthalmia hypersensitivity to pigment is the rule although patients with acute exacerbations of the disease may have a definite phase in which the intracutaneous test is negative. The development of pigment hypersensitivity does not appear to be the cause *per se* of sympathetic ophthalmia. The findings of the authors study indicate that some other factor enters into the disease. The nature of this additional factor is unknown. It is possible that there are differences in the immune response of different persons or that allergy to pigment may alter the normal immunobiological defense mechanism of the eye so as to allow some other specific agent to produce the characteristic picture of the disease. In the cases of patients with a positive reaction to the intracutaneous test treatment with uveal pigment appears to be of value. The beneficial effects may be due to desensitization with pigment which allows restoration of the normal immunobiological defense mechanism.

LESLIE L. MCCOY, M.D.

Lindner, K.: A New Method of Operation for Retinal Detachment With the Retinal Defects at the Posterior Pole of the Eye (Ueber eine neue Operationsmethode fuer Netzhautablösungen bei Netzhautdefekten am hinteren Augenpol). *Arch f Ophth.* 1933 CXXVIII, 654

In 1930 Guist operated upon three cases of macular hole removing the lateral orbital wall with preservation of the anterior orbital rim and then cauterizing at the posterior pole of the eye. In two of the cases healing occurred. However the operation has proved very difficult and requires an average of four hours. Moreover in one case injury of the ciliary nerves by the operation or the action of the caustic led to long persisting corneal abscesses which were apparently associated with complete anesthesia of the temporal half of the eyeball.

In December 1931 after preliminary investigations on the eyes of rabbits Lindner operated upon two patients with a macular hole by a new method.

The first case was that of a woman forty-six years old who had had a macular hole and almost complete retinal detachment for two months and presented coarse flaky and thread like vitreous opacities in the right or better eye. Vision in the right eye permitted only the counting of fingers at a distance of 3 meters. Under treatment with stenopoeic glasses without rest in bed the detachment became so flattened in the course of eight days that at least as regards the vitreous, operation could be undertaken with the prospect of good results. After canthotomy an incision was made in the conjunctiva in the folded area corresponding to the temporal half of the bulb and the conjunctiva was separated posteriorly. The lateral rectus was then cut from its attachment following the insertion of a catgut

suture in the end of the muscle. Blunt dissection of Tenon's capsule was done. Twenty four millimeters behind the limbus, somewhat above the horizontal meridian in order to avoid the long posterior ciliary artery entry through the sclera was made with the lance and the choroid carefully exposed. It was then possible to slip a graduated spatula between the choroid and sclera without the slightest resistance. Examination with the ophthalmoscope showed that the spatula entered above the macula and reached the upper part of the disk margin. On the third careful attempt, the point of the spatula rested exactly at the macular hole. An injection of 1/25 c.cm. of a 6 per cent solution of caustic potash was then made by means of a finely graduated syringe with a silver cannula. Then, between the limbus and the scleral opening, two trephine holes were made somewhat above the horizontal meridian, and from these the choroid was undermined to a point near the ora serrata. An injection of 1/50 c.cm. of the 6 per cent caustic potash solution was then made subchoroidally corresponding to each of the trephine holes. After the injection the sclera appeared as a dark band 4 mm wide. The operation was completed by perforation of only the posterior trephine hole, suture of the muscles, and closure of the conjunctiva.

On ophthalmoscopic examination immediately after the operation the macular hole appeared almost black, this coloration being due doubtless to staining by the caustic potash of a hemorrhage occurring during the operation.

Eight weeks after the operation, examination revealed at the posterior pole of the eye an extensive gray area partly surrounded by hemorrhage. From this there extended anteriorly and upward a broad, irregular pigmented band with the appearance of striped retinochoroiditis. The visual field showed a large central scotoma of about 30 degrees. The peripheral fields were normal. Vision permitted the counting of fingers at a distance of 1/4 meter.

In the second case, that of a woman forty-three years of age with myopia (13 diopters), total detachment with a typical long horsehoe-shaped tear in the 17 degree meridian had been present in the right eye for three weeks. In the macula there was a sharply outlined round hole. Vision was reduced to the discernment of hand movements. In a period of fourteen days the use of stenopæic glasses resulted in extensive flattening of the detachment and improvement of vision sufficient to permit the counting of fingers. The operation was somewhat different from that performed in the first case. The superior rectus was cut off and the tear surrounded by seven trephine holes with preservation of a thin layer of sclera. An injection of 1/100 c.cm. of a 6 per cent solution of caustic potash was then made. Immediate ophthalmoscopic examination showed that the macular hole was hit exactly. The trephine holes around the anterior torn area were then opened with the lance as far as the bare choroid and around the nasal side of the tear were united sub-

choroidally by the use of a spatula. Each segment between the trephined areas was treated with 1/100 c.cm. of the 6 per cent solution of caustic potash. The operation was concluded by making a subchoroidal pocket about 6 mm. long backward, infusing 1/100 c.cm. of the 6 per cent solution of caustic potash, perforating two trephine openings, and closing the muscle and conjunctiva.

Eight weeks later there was a grayish red field in the region of the macula and the retina was adherent. Vision was -12.00 w +6.00 cyl.-6/60, and with telescopic spectacles =6/8. The visual field was normal. Hardly any central scotoma could be discovered.

In the use of his new operative method for ordinary detachments the author now employs a 3 per cent solution of caustic potash instead of a 6 per cent solution as the latter is too destructive. A favorable result is to be expected from this chemical agent which produces a swelling necrosis as it has a deep action. The chemical agents belonging to the group of heavy metallic salts—which, in contrast, cause a coagulation necrosis—produce a localized inflammation and do not work through the choroid so easily. Moreover some of them, silver nitrate for example, cause a strong exudation with a purulent character and are therefore unsuitable.

The author has since used the described procedure, which he calls an "undermining method," also in other cases of detachment. Instead of obtaining adhesion through a single cautery point, he is able, by the undermining method, to obtain a continuous adhesion. The method has the advantage that only a few trephine openings are required and therefore time is saved. Moreover, the adhesion is continuous and the great danger of hemorrhage in the interior of the eye is considerably decreased. Of disadvantage is the fact that retina is functionally disturbed to a greater degree than after the operation performed through single trephine holes with free spaces between. However this is not so important as the involvement usually occurs in the peripheral parts of the retina.

RICHARD (O)

NOSE AND SINUSES

Eigler G.: Endothelioma, Perithelioma, Cylindroma, and Similar Tumors of the Upper Respiratory Tract (Ueber Endothelioma, Perithelioma, Cylindroma und ähnliche Tumoren der oberen Luftwege) *Arch. Otol.-laryng. Halsk.* 193, cxviii, 809.

This article is based on a review of the various tumors observed in the last few years at the Halle clinic, most of which were diagnosed by biopsy as endotheliomata. In judging the malignancy of a tumor special attention was paid to the history and the course of the condition. On the basis of their histological structure and their genesis, the neoplasms could be divided into five distinct groups. In this grouping the clinical benignancy or malignancy of the individual growths was not considered be-

cause thus could not always be determined accurately from the histopathological picture. All of the neoplasms arose from the region of the upper respiratory tract and the mouth. On the basis of their endothelial genesis hemangiomas and lymphangiomas were excluded.

Group 1 (four tumors). The neoplasms in this group are designated as "fibromatous or sarcomatous angioplastic peritheliomas." The most important part of their structure consisted of newly formed blood vessels. Tumor formation (partly vascular partly avascular) occurred around the vessel lumina. The stroma showed a tendency toward hyalinization. There was no demonstrable mucus formation. Such tumors, especially those which in large areas have lost close communication with blood vessels are to be considered clinically malignant even though they do not appear to be sarcomatous in all portions. Of the four tumors studied by the author one was a bleeding septal polyp one was on the hard palate and the two others originated from the cribriform plate of the ethmoid bone.

Group 2 (three tumors). These neoplasms were blastomata with characteristic structure and a certain similarity to true endotheliomas but as their origin could not be determined definitely they were considered mesodermal malignant tumors. The first of the three was in the cribriform plate and the neighboring orbit and had broken through the dura. The second, which had a base the size of a German mark was situated on the hard palate extended to the soft palate pushed the upper pole of the tonsil down, and had formed metastases in the regional lymph glands. The metastasis travelled the same course as that usually followed by postanginal sepsis. In front of the auricular muscle there was a floating movable mass about the size of a hazelnut. The third tumor closed the nose by its large mass and caused marked edema of the soft palate.

Group 3 (three tumors). The tumors in this group were of uncertain origin and therefore considered special forms of sarcoma. All were located in the nose. Clinically they at first suggested polyps, but because of their active growth tendency they were considered malignant.

Group 4 (three tumors). These neoplasms included benign and malignant tumors which some what resembled peritheliomas. They were designated as angioplastic epithelial growths. One of them had destroyed the right half of the hard palate and the lower half of the septum and had filled the right half of the nose with easily bleeding polypoid masses. The tumor formation on the palate had been present for twelve years without forming metastases. Another of the tumors in this group was a firm, superficially necrotic neoplasm which filled the right side of the nose the right choana and the right half of the nasopharynx and had caused exophthalmos. The third tumor was a neoplasm with a red irregular surface extending posteriorly and to the left at the level of the second or third tracheal ring.

Group 5 (four tumors). The tumors in this group were neoplasms of the type described by Billroth as "cylindromata" and showed evidences of malignant change. In Engler's opinion they are of epithelial origin. Their typical location is the posterior part of the mouth the pharynx and the entrance to the larynx. They are usually sharply circumscribed and encapsulated but tend to recur locally and to form regional metastases. Therefore from the therapeutic standpoint they are to be regarded as malignant. Koschler's term for them carcinoma cylindromatosum is appropriate.

Engler discusses the clinical history and histopathology of the individual tumor groups and draws conclusions therefrom regarding the clinical aspects and pathogenesis of the neoplasms. The article contains ten photomicrographs.

A. ALBRECHT, M.D.

MOUTH

Stewart, C. B.: The Care of Cervical Glands in Intra Oral Carcinoma. *Am J Roentgenol* 1933
xlii 234

Failure of patients with intra oral carcinoma to recover is usually due to metastases in the regional glands. This is often true even after the primary lesion has been successfully eradicated.

Although difficult to prove it seems that irradiating the regional lymphatics before the primary lesion is treated vigorously raises the power of defense of these glands against cells that may spread to them.

Sufficient statistics upon which to compare the results from surgery with those of irradiation are not available. Bloodgood reports a five year cure from surgery alone in 50 per cent of cases of metastasis to the cervical glands from cancer of the lip and estimates the incidence of five year cure from such treatment in cases of metastasis from carcinoma of the tongue at 10 per cent. Shreiner and Simpson report no cures of cervical metastases from external irradiation and a five year cure in only 3 per cent of cases treated with unfiltered radium implants. These results served to introduce the combined therapy used at the Steiner Clinic and elsewhere.

In cases which present no evidence of glandular invasion a full skin erythema dose of high voltage roentgen therapy is given to both sides of the neck including the primary lesion. The primary lesion is treated later and six weeks after the first treatment the neck treatment is repeated. If a suspicious gland is encountered gold tubes sufficient to give 10 skin erythema doses are introduced either through the skin or by exposing the node.

Cases in which the glands are firm and have not broken down or become firmly adherent are treated first by external irradiation in the same way as cases with no evidence of glandular involvement. A careful operative dissection is then done. This is as radical as possible. Before closure of the wound

small filtered emanation tubes are carefully placed in all suspicious areas. After the treatment the patient is examined frequently for recurrence.

In late cases in which surgery is not followed by cure sufficiently often to justify the inconvenience the operation causes the patient, external irradiation is re-enforced by interstitial implants. This offers palliation for a prolonged period and occasionally a reasonable hope for cure.

WILLIAM G. HANCO, M.D.

Duffy, J. J.: Conservative Procedure in the Care of Cervical Lymph Nodes in Intra-Oral Carcinoma. *Am J Roentgenol*, 1933, xlix, 141.

In cases of intra-oral cancer the cervical lymphatic system has received increased attention during the past three decades and complete unilateral neck dissection has been done in most surgical clinics for about twenty five years. This operation has been performed when the nodes were not palpable as well as when there were glandular metastases in the operable stage. To be operable glandular metastases must be limited to the same side as the primary lesion and to 1 chain or at most 2 triangles of the neck, and must not have penetrated the capsule of the gland.

Inoperable glandular metastases are those which have perforated the capsule and infiltrated the surrounding tissues, those appearing on the other side of the neck, and those due to a primary epidermoid carcinoma of Grade 3 a transitional-cell carcinoma, or a lympho-epithelioma.

In the author's cases of intra-oral cancer the cervical region is treated as follows:

At the time of the patient's admission to the hospital, both sides of the neck, including the primary lesion and the regional nodes, are subjected to extensive irradiation. This is done even when no nodes are palpable. The dose and method of irradiation depend on the type and location of the lesion. When interstitial irradiation of the primary lesion is indicated, it is done after completion of the external irradiation. In cases which are far advanced only the palliative external irradiation is given. The dose depends upon the general condition and the stage of the disease. Many cases of transitional-cell carcinoma and lympho-epithelioma require no other type of irradiation.

In cases with inoperable metastases in the lymph glands complete removal of the contents of both the anterior and the posterior triangles of the neck, together with the sternomastoid muscle and internal jugular vein, is done. In all dissections, whether complete or partial, closure of the wound is preceded by the implantation of gold tubes of radon in the locations where the lymphatic channels have been severed. In interstitial irradiation the gold tubes are placed directly through the anesthetized skin into the tumor mass. In less advanced cases the mass is surgically exposed after preliminary external irradiation and further irradiation is then carried out under direct vision.

The author analyzed a group of 134 cases of microscopically proved malignant lesions of the oral cavity including carcinoma of the tongue, floor of the mouth, inferior maxilla, mucosa of the cheek, soft palate superior maxilla, and antrum which were admitted to the Memorial Hospital, New York, in 1935 and 1936. Sixty five (47.7 per cent) were inoperable. In 123 (52.3 per cent) there were no glandular metastases when the patient entered the hospital, but in 59 (33.5 per cent) of these such metastases developed and in 16 of the 59 the metastases were inoperable. To the 46 patients who had operable glandular metastases at the time of their admission to the hospital were added 3 who developed such metastases after admission, the total number of those with operable metastases being therefore 59. In 37 of the cases of operable glandular metastases a complete dissection of the neck, and in 13 cases a partial dissection of the neck, was done. In the 9 other cases no operation was performed. To the 65 patients who had inoperable glandular metastases at the time of their admission to the hospital were added 16 who developed inoperable glandular metastases after their admission. Therefore the condition was inoperable in 81 (34.6 per cent) of the cases.

Conservation is maintained in the cases of patients without metastases in the cervical lymph glands, and the field of operable glandular metastases is being narrowed as experience is gained in the management of the advanced and borderline cases of cervical metastases from intra-oral cancer.

CHARLES C. REED, M.D.

Blair, V. P., Brown, J. B., and Hamann, W. G.: The Radical Treatment of Carcinoma of the Lip. *Am J Roentgenol* 1933, xlix, 290.

Cases of cancer of the lip are divided roughly into four clinical groups: (1) those of early lesions of uncertain character; (2) those of small but active lesions in which there is little doubt as to the diagnosis; (3) those of advanced lesions of intermediate extent; and (4) those of practically inoperable lesions. The plan of treatment depends more or less on the stage of the lesion.

In the authors' cases of early indeterminate growths the lesion is excised and careful suture is done. In those of early typical lesions the cutting cautery is used and spontaneous healing awaited. The choice between irradiation and dissection of the glands depends largely on the microscopic picture.

In cases belonging to the second clinical group the tumor is removed and repair is made with flaps from the same or the other lip. Dissection of the glands may then be done immediately but as a rule is delayed. In certain primary cases in this group radium irradiation is used by choice.

In cases of advanced lesions of indeterminate extent wide removal or destruction, usually with the cautery is necessary. As a rule it is best to keep the patient under observation for recurrence

for a time before repair is done. Any bone involvement is destroyed with the cautery or the soldering iron and spontaneous separation of the sequestra is awaited before the repair is undertaken. Gland dissection may be done at the time of the original operation but may be delayed until the danger of local recurrence is remote.

Inoperable cases are treated with radon, radium element, or the roentgen rays.

In all cases of squamous-cell carcinoma of the lip a complete block removal of the lymphatic areas in the submaxillary and submental regions and the side of the neck to a point well below the bifurcation of the carotid is necessary. Palpability of lymph nodes does not necessarily contraindicate excision. Involvement of the lymph nodes may not become manifest until as long as eight years after cure of the primary lesion.

Gland involvement occurs most commonly in the submaxillary and buccal glands, around the parotid and in the submental glands. The salivary glands themselves are very rarely involved. The authors treat the neck with roentgen irradiation routinely whether dissection is done or not.

In conclusion they state that the upper lip requires as careful consideration as the lower lip.

NECK

Carmona L: The Kottman Reaction (Sulla reazione di Kottmann) *Clin. chir.* 1932 VIII, 1057

In experiments on normal animals the author found a considerable variation in the Kottmann reaction. In 25 per cent it was accelerated sufficiently to correspond to the values given by Kottmann as indicating hypothyroidism. The more rapidly the test was done after the blood had been drawn the more constant and the less retarded was the reaction. Unilateral thyroidectomy resulted in irregular and inconstant changes in the reaction. Total thyroidectomy caused a constant slowing of the reaction. This is of particular interest because according to Kottmann slowing of the reaction is an indication of hyperthyroidism. Injection of thyroid extract resulted in more or less marked acceleration of the reaction. Removal of the testicles caused no significant changes, but the injection of testicular extract was usually followed by considerable acceleration of the reaction. Excision of the ovaries accelerated the reaction slightly and the injection of ovarian extract accelerated it strikingly.

LEO M. ZIMMERMAN, M.D.

Neumann F: The Question of Chronic Thyroiditis (Zur Frage der chronischen Thyreoiditis) *Beitr. z. klin. Chir.*, 1932 CIV, 253

The author reports a case of non-specific chronic thyroiditis with vascular changes which were formerly considered characteristic of syphilis but may occur also in tuberculosis and non-specific inflammations as was evident in a case reported by Ruppanner and three cases reported by Roulet.

The patients presented no other suggestion of syphilis and in some of them another cause could be definitely proved. Therefore the vascular changes are not specifically syphilitic, but occur in other chronic inflammations of the thyroid gland. Perhaps the very chronic course of the inflammation is responsible for the vascular changes, the relatively inactive granulation tissue of the chronic inflammation not destroying the vessel but growing through it, obliterating its lumen, and leaving its shadow the elastic ring. Acute inflammations completely destroy vessels of this caliber even in the thyroid gland. In all such cases the diagnosis is difficult and the therapeutic indications are obscure. Confusion with malignant struma is possible. Roentgen irradiation is indicated. Malignant goiters (carcinomata in contrast to sarcomata) react surprisingly well to the roentgen rays, whereas chronic inflammatory diseases of the thyroid react slowly if at all. In operable cases total extirpation is the procedure of choice, but if a positive diagnosis cannot be made at operation resection of the thyroid is sufficient. Complete substitution by the administration of thyroid preparations is feasible, as the function of the inflamed gland is greatly reduced. In tuberculous inflammations of the thyroid the entire gland should be removed. If syphilis is suspected antiluetic treatment should be considered.

ERICH HENDEL (Z)

Towers J R II: Masked Hyperthyroidism as a Cause of Heart Disease *Lancet* 1933 CCXIV 67

Of fifteen patients with hyperthyroidism all sought treatment for cardiac symptoms. Their average age was fifty-two years. All of them were women. The average duration of the symptoms was three and eight tenths years. The majority of the women were apathetic in appearance and well nourished. The picture they presented was quite unlike the classical picture of Grave's disease. The diagnosis was indicated by the cardiac condition.

Suddenness of the apex beat was noted even when the rate was slow. This suggested an increase in the size of the heart but in most cases the heart was not enlarged. The apex impulse may be likened to that given by a normal heart after exercise. Extrasystoles occur with a rapid rate. Paroxysmal auricular fibrillation is another arrhythmia commonly associated with the condition. Roentgenography of the heart has been of value. The organ is not enlarged as a whole and is smaller than is suggested by clinical examination. Pulsation is increased. The pulmonary arc may be fuller than normal and therefore produce a straight left border to the heart shadow. When the patient is turned into the first oblique position the straight posterior border with no enlargement of the left auricle is in striking contrast to the shadow seen in mitral stenosis, from which it must often be differentiated. As this condition occurs most frequently in older persons, the typical 'thyroid heart' is less commonly noted as associated aortic atheroma or a slight in-

creases in the blood pressure due to other causes may modify the picture.

Thyroid enlargement was absent in ten of the cases reported and only slight in the others. Exophthalmos was absent but two of the patients had a slight stare. In most of the cases the metabolic rate was increased, but in several it was normal. In none was there a marked loss of weight. Five patients had chest pain of an anginal nature which was usually felt at the onset of the palpitation.

Of great value in the diagnosis was the failure of rest and digitalis to affect the condition.

GEORGE A. COLLETT, M.D.

Bling J.: Sporadic Goiter of Genotypic Origin and Its Relation to Other Diseases of the Thyroid Gland (Die genotypisch bedingte sporadische Strumen-Kropf- und deren Verhalten zu anderen Thyreoiden-Leiden) *Acta med Scand* 1932 147, 298.

Following a review of three series of cases of familial goiter recorded in the literature the author reports nine definite cases and one questionable case which occurred in a single family. The goiter appeared as a hereditary dominant factor, but was limited to females. The patients were living in a non-goitrous region but some of them had been reared in another community. Therefore, ordinary endemic factors were excluded. No relation was found between the inheritance of blood groups and of goiter.

In a study of a large series of cases of sporadic goiter a familial disposition was found in 17 per cent of the patients, males as well as females. An

almost identical incidence of a familial tendency was found in a smaller group of patients with Basedow's disease. In families with a tendency toward goiter simple goiter, exophthalmic goiter and myxedema were encountered. LEO M. ZIMMERMAN, M.D.

Valdoni P.: Endofogular Metastases of a Progressive Malignant Tumor of the Thyroid (Metastasi endofogulari da progressivo tumore della tiroide) *Arch Ital di chir*, 1933 xxxii, 749.

The author reports the case of a woman forty five years old who had a non toxic nodule in the right lobe of the thyroid gland. Excision revealed normal thyroid tissue. Recurrence associated with pain and symptoms of mild hyperthyroidism led to lobectomy fourteen months later. Within two months after the second operation the swelling re-appeared. After thirteen months a third excision was done. At this time there was no clinical evidence of hyperthyroidism. The mass was found to be a distended internal jugular vein filled with an adherent tumor thrombus. The entire right internal jugular vein together with the proximal portion of its tributaries was resected. On histological examination the tumor thrombus was found to be a carcinoma of the thyroid. Re-examination of the tissues removed at the previous operations showed that the original nodule was a cylindrical adenocarcinoma and the recurrent mass removed at the second operation was a malignant papilloma. The endofogular metastasis was a papillomatous carcinoma. When the patient was re-examined twenty months after the third operation no evidences of recurrence or of further metastases were found. LEO M. ZIMMERMAN, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Parker H. L. and Kernohan J. W.: Stenosis of the Aqueduct of Sylvius. *Arch Neurol & Psychiat* 1933 xxiv, 535

The authors report six cases in which a chronic pathological process led to progressive narrowing of the aqueduct of Sylvius. In five the stenosis caused urgent clinical symptoms demanding relief. Unfortunately there was a marked similarity in the clinical symptoms produced by diverse pathological processes. Essentially the clinical picture was that of chronic internal hydrocephalus with evidence of increased intracranial pressure in the form of headache, vomiting and visual disturbances. Autopsy, performed in all of the cases, revealed pathological changes which included those due to syphilis, tuberculosis and new growths. Chronic proliferative processes in the periaqueductal neuroglia were also found. Some were of inflammatory or toxic origin and others the result of developmental error. In one case the narrowing of the aqueduct was due to congenital malformation. The ages of the patients ranged from six to thirty five years.

The differential diagnosis between occlusion or narrowing of the aqueduct and tumors filling the fourth ventricle is always difficult. Ventricleography does no more than establish the presence of internal hydrocephalus of the lateral and third ventricles. While it may suggest the possibility of occlusion of the aqueduct of Sylvius from causes in the vicinity of the canal tumors with such an effect which are capable of removal cannot be excluded. Nevertheless the study demonstrates the frequent existence of chronic processes in the tissues surrounding the aqueduct of Sylvius and the great variety of conditions producing the same disturbances.

Granulomatous processes and new growths are more readily understood and recognized on pathological examination. However, there remains a definite group of cases in which the pathological changes are chronic proliferation of the glia surrounding the aqueduct. These are not so readily interpreted. Chronic ependymitis, periaqueductal gliosis and congenital narrowing of the aqueduct of Sylvius are ultimately fatal and little understood. One of them may grade imperceptibly into another. They may occur at any time from prenatal existence to the end of the natural span of life.

Davis, L. and Haven, H. A.: The Surgical Anatomy of the Sensory Root of the Trigeminal Nerve. *Arch Neurol & Psychiat* 1933 xxix, 1

In their studies on the surgical anatomy of the trigeminal nerve Davis and Haven reviewed the

developmental anatomy, the physiology and the neuro-anatomy of the sensory root of the nerve. From the developmental standpoint they found evidence that the fibers of the sensory root do not pursue a straight parallel course from the ganglion into the brain stem. Rather there are crossings and anastomoses of the fibers and a distinct rotation.

Studies on the functional topography of the root revealed no definite arrangement of fibers according to function. There was a fairly regular intermingling of the small and large fibers in the root near the ganglion as well as near the brain stem. The authors were unable to substantiate any theories of topographic arrangement of fibers in the sensory root near the brain stem on a functional basis. Therefore they believe there is no physiological foundation for any operation directed at the differential interruption of certain functions by partial section of the sensory root near the brain stem.

Gross dissections of the human sensory root served to confirm the finding by previous investigators of a plexiform arrangement of the rootlets near the ganglion and numerous branchings and ramifications in the root along its course toward the brain stem. Degeneration experiments performed on cats revealed that although there are numerous anastomoses along the course of the root the fibers which come from the various divisions of the gasserian ganglion appear to occupy a definite position in the root in the region of its entrance zone. The fibers from the ophthalmic division occupy the inferior and median position, the fibers from the mandibular division, the superior and lateral position and the fibers from the maxillary division the intermediate area.

From their studies the authors conclude that if a subtotal or differential section of the sensory root is performed it should be done very close to the ganglion to make certain that all of the fibers of the desired division are sectioned.

Spiller W. G. and Frazier C. H.: The Douloureux: Anatomical and Clinical Basis for Subtotal Section of the Sensory Root of the Trigeminal Nerve. *Arch Neurol & Psychiat* 1933 xxix, 50.

Spiller reviews the experimental anatomical data with reference to operations directed toward subtotal section of the sensory root of the trigeminal nerve. He takes issue with the statement of van Nieuwenhuys that the sensory root of the fifth nerve is not composed of three parts corresponding to the three peripheral branches from the gasserian ganglion. He presents evidence from his own observations and those of others which tends to prove that there is a fascicular arrangement throughout the various parts of the trigeminal nerve.

Fraser discusses clinical data on the basis of a series of cases selected at random from his experience during the past seventeen years. He states that he was convinced by his early experience that, at least at the point where the sensory root enters the ganglion, the inner the middle, and the outer thirds supply corresponding portions of the ganglion and the ophthalmic, maxillary and mandibular divisions peripheral to the ganglion. In cases in which the pain was referred only to the third division, only the outer third of the root was divided and in those in which the pain was referred only to the second division, only the middle portion of the root was divided. While an exact subdivision of the root into thirds was not always possible, he found it necessary to leave only one or two fasciculi of the inner and outer portions of the root intact to supply the remaining two-thirds of the ganglion when operation was directed at the second division.

From the clinical evidence he concludes that the outer portion of the root supplies the outer portion of the ganglion and the mandibular division, the middle portion of the root supplies the middle portion of the ganglion and the maxillary division, and the inner portion of the root supplies the inner portion of the ganglion and the ophthalmic division.

HALE HAYES, M.D.

Findlay, J. P.: Facial Paralysis Due to Toxic Inflammation of the Genuiculate Ganglion. *Med J Australia*, 1933, 1, 51

The author discusses the syndrome following inflammation of the geniculate ganglion, the Ramsey Hunt syndrome. This consists of (1) intense otalgia and tinnitus, (2) facial paralysis on the side of the lesion, (3) loss of taste, and (4) herpes zoster on the drum membrane, the walls of the external canal, the external meatus, the carum concha, the antitragus, the anthellic, and part of the lobule.

If the inflammation extends proximally and involves the eighth nerve, vertigo, nystagmus, and vomiting may result.

The treatment indicated is massage, electrical treatment and removal of focal infection.

Five cases are reported briefly.

LEO M. DAYMORF, M.D.

Duel, A. B.: Clinical Experiences in Surgical Treatment of Facial Palsy by Autoplastic Nerve Grafts: The Ballance-Duel Method. *Arch. Otolaryngol.*, 1933, 71, 707

The practical outcome of the work of Ballance and Duel, so far as otologists are concerned, is the fact that their experiments led them to deprecate anastomosis of the facial nerve with one of the adjacent nerves in the neck as a method of restoring lost facial function and to advise in place of this method, the use of an autoplastic graft to bridge the gap from the proximal to the distal segment caused by injury or disease.

Twelve cases are reported and the results of operation in four of them are shown. In many of the

cases it is too early to predict how complete the recovery will be.

The area of destruction of the nerve varied from 15 to 40 mm. in length.

It seems certain that even most careful observation of the face by the anesthetist during the operation for sudden spasm of the muscles is an indication of injury of the nerve is unreliable. Trauma severe enough to cause facial palsy may be inflicted without any observed spasm and while spasm may be informative at times when seen positively its absence is not an accurate indication of whether, when, or how extensive an injury to the facial nerve may have occurred.

These experiences point conclusively also to the advisability of uncovering the nerve at once whenever facial palsy immediately follows an operation on the mastoid, in order to determine the extent of the damage. Compression or slight injuries may then be remedied by decompression, with assurance that in many cases there will be complete or nearly complete recovery.

In many cases prompt inspection will show that the accident has destroyed or damaged a longer segment of nerve. Immediate operation will permit decompression of the nerve above or below the point of injury in time to avert the dire consequences of prolonged inflammatory compression. A suitable graft may be introduced to replace the damaged segment at once. As there can be only slight atrophy of the muscles from non-use a quick and more perfect recovery is assured.

In his experiments on animals the author demonstrated definitely that any autoplastic nerve graft, either motor or sensory, with the direction of the proximal and distal ends either maintained or reversed will successfully bridge the gap and restore the function of a divided facial nerve.

Although the external respiratory nerve of Bell was originally suggested as the source of the graft, Duel gives several reasons why an intercostal nerve is the more practical.

Delay of operation may result in failure.

Operating in a supporting field demands great subsequent care to prevent necrosis of the graft until it is protected by healthy granulations.

Rules for the care and dressing of the area are given.

JAMES BARRETT BROWN, M.D.

SPINAL CORD AND ITS COVERINGS

Kernohan, J. W., Wolman, H. W., and Adson, A. W.: Gliomata Arising from the Region of the Cauda Equina: Clinical, Surgical, and Histological Considerations. *Arch. Neurol. & Psychiat.*, 1933, 21, 157

The authors state that the filum terminale is not the rudiment which it is generally supposed to be. It is made up of all of the elements which are present in the spinal cord, namely glial cells, especially astrocytes and some oligodendroglial cells. However, no microglial cells were found in any of the normal

tissue examined. Ganglion cells were common, but none was normal. There were many neuroblasts or immature forms of ganglion cells. Many axillary cylinders were also present. Myelin was demonstrated in considerable amounts in some cases and was almost absent in others. The most interesting histological feature of the filum terminale was the masses of ependymal cells distributed throughout its entire length.

In more than 80 per cent of the cases of glioma studied by the authors the initial complaint was pain and in about 8 per cent it was weakness. Sphincteric disturbances were present in 32 per cent but were not the first complaint in any. As might be anticipated from this group of symptoms an early diagnosis is often difficult and may be impossible.

In eight of the cases studied both the patellar and the Achilles tendon reflexes were normal. In seven cases, roentgenograms were of aid in the diagnosis of tumor. Camp and Adson recently called attention to the importance of a more careful study of the pedicles, which are often eroded in cases of tumor. In eighteen of the cases studied the spinal fluid removed was yellow and in eight the needle entered the tumor.

Eighteen of the tumors reviewed by the authors arose from the filum terminale and seven involved the conus medullaris and the filum terminale.

As a rule gliomata arising from the region of the cauda equina originate from a single area in the filum terminale but occasionally they appear to have originated in several areas and to have coalesced. They are soft and usually very vascular and capable of producing erosions of the laminae, the pedicles, and the bodies of the vertebrae. They cause thinning of the meninges but rarely break through them to invade the adjacent tissues. The authors have never seen them invade nerve trunks. They grow between the roots of the cauda equina and extend along the roots into the intravertebral spaces making extirpation very tedious. When the patient presents himself for surgical relief, the tumor is usually very large and extensive. It often extends from the eleventh dorsal vertebra to the sacrum.

Of the eighteen tumors of the filum terminale studied by the authors fifteen were completely removed and three were partially removed. Recovery without recurrence for periods up to thirteen years was obtained by removal of the tumor and wide resection of the filum terminale, but only partial and temporary relief was obtained by partial resection, decompression, and roentgen therapy. The degree of recovery depends more on the compression of the conus medullaris than on pressure of the roots. The symptoms from root pressure disappear satisfactorily following removal of the tumor. In the cases reviewed there was one postoperative death that of a senile patient who died on the seventh day from coronary occlusion. The three patients treated by partial removal of the tumor died from three to four years after the operation. Two of them died presumably from pyelonephritis and one from an ependymoma of the medulla.

Of the seven cases in which the lesion involved the conus medullaris and the filum terminale complete resection of the tumor was done in one and partial resection in six. In the latter the resection of the conus failed to include all of the tumor even though it was done as high as the lower border of the eleventh dorsal vertebra. In two prolonged partial relief was obtained, the patients recovering to the extent that they were able to carry on their regular vocations for three years. In the others there was no appreciable improvement.

From these results it is apparent that for complete removal of a tumor of the filum terminale an early diagnosis is essential. Complete removal gives better results than partial resection although it is tedious and time-consuming and may require performance of the operation in stages in order to avoid too great surgical shock.

Resection of the conus medullaris containing the tumor is justifiable if there is a fair prospect of including all visible growth.

Caraffa J. B.: A Surgically Treated Extradural Fibroma (Fibrome extradural opéré). *Rev. Sud. An. de med. et de chir.*, 1932, III, 945.

Caraffa reports an extradural fibroma occurring in a man twenty-four years old. The first symptom pain radiating from the waist into the lower extremities was noted a year prior to operation. Weakness of the lower extremities was first noticed two and a half months later and progressed to spastic paraplegia. Other symptoms were painful contraction and numbness of the lower extremities, frequency of micturition, transitory numbness of the hands and forearms, bilateral ankle clonus, a bilateral positive Babinski reaction, and a spastic gait.

The suboccipital injection of 1.5 c. cm. of Iliodol disclosed a block at the level of the first and second dorsal vertebrae. Operation revealed a hard extradural fibroma, about the size of a small hazelnut which was adherent to the lamella between the seventh cervical and first thoracic vertebrae. Fifty-five days after the operation the patient was able to walk without aid although his gait was slightly spastic and the pyramidal symptoms persisted.

The author emphasizes the value of Iliodol in the localization of such tumors and states that early diagnosis is of primary importance for successful operation.

ANTHONY STURDEVANT, M. D.

PERIPHERAL NERVES

Farneti I. P.: The Physiotherapeutic Treatment of Neuralgias of the Brachial Plexus (Il trattamento fisioterapico nelle nevralgie del plesso brachiale). *Palidina*. Rome, 1932, xxxix, sez. med. 631.

In forty-two cases of brachial neuralgia the author experimented with various physiotherapeutic procedures. Erythema doses of ultraviolet irradiation gave the best results in cases of so-called essential or idiopathic neuralgias, and diathermy the best

results in cases of secondary brachial neuralgias due to arthritic changes of the cervical spine. Farnell is of the opinion that the ultraviolet rays cause a reflex action modifying the circulation in the nutritive vessels of the affected nerves and a secondary general reaction of a humoral nature.

In the application of diathermy to the cervical spine he applies the active electrode (a plate measuring 8 by 12 cm. moulded and held in place with wide rubber bands) over the cervical spine and one of two indifferent electrodes (measuring about 9 by 18 cm. both connected to the same pole of the machine, and moulded) over the lower third of each arm. He believes that this method brings maximal heat to the cervical spine and yields better results than methods employed previously.

DAVID JOHN IMPASTATO, M.D.

Conway F. M. Traumatic Ulnar Neuritis. *Ann. Surg.* 1935, 100B, 435

In injuries about the elbow joint the ulnar nerve is especially vulnerable to trauma. Conway describes a neuritis which may develop as a late sequel to fractures of the external condyle of the humerus. Such fractures may be difficult to reduce. When reduction is incomplete a fair functional result may be obtained but the forearm is deviated outward with an increased carrying angle. The deformity increases with time because of overgrowth of the medial condyle as compared with the external

condyle. The ulnar nerve in its bed behind the medial condyle is stretched with each flexion of the forearm. A similar condition may obtain when the ulnar nerve is hypermobile and slips forward on the epicondyle.

Such trauma long continued, may result in a compression neuritis of the ulnar nerve. On histological examination the nerve then shows the picture of chronic interstitial neuritis. The neuritis may lead to partial or complete paralysis of the ulnar nerve with analgesia of the small finger and ulnar border of the hand and, in advanced cases paresthesia and atrophy of the muscles supplied by the nerve with characteristic weakness and claw hand deformity.

The four possible methods of treatment are simple freeing of the nerve in its bed, the gouging out of a posterior condylar channel supracondylar osteotomy of the internal condyle, and transplantation of the ulnar nerve from its groove to a new bed anterior to the medial epicondyle. The last is the only method free from serious objections. It is the method recommended by Conway.

In the case reported in this article the injury to the elbow occurred when the patient was two years old. The lateral epicondyle was not replaced, and twenty years later paralysis of the ulnar nerve occurred with the changes described. Such a long latent period is very characteristic. Neurolysis performed under local anesthesia was followed by almost complete relief of the symptoms. JOHN W. EATON, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Taddel A: The Bleeding Nipple (Contributo allo studio della mammella sanguinante) *Clin chir* 1932 VIII 763

The author reports a study of four cases of bleeding nipple. From his findings and a review of the literature he concludes that bleeding from the nipple is a sign characteristic of intracanalicular dendritic epithelioma. As he believes that this neoplasm may become malignant, he advises radical removal of the breast with resection of the axillary lymph nodes.

PETER A. ROSE, M.D.

Pettinari V: Tuberculosis in Resistant Organs. Tuberculosis of the Breast (Contributo alla conoscenza della tubercolosi in organi resistenti. La tubercolosi della mammella) *Clin chir* 1932 VIII, 794

The author reports the case of a woman fifty-eight years old who for a year prior to her admission to the clinic suffered from bilateral pleurisy and cervical adenitis. Treatment of the cervical lymph nodes by roentgen irradiation was followed by improvement. The patient then remained relatively well for about seven months but at the end of that time a painful mass the size of an apple appeared in the left axilla. Treatment of this mass with the X rays caused it to disappear but it soon recurred. About a month prior to the patient's admission to the clinic a small mass appeared in the upper outer quadrant of the left breast and grew rapidly up to the size of a large apple. The general history revealed nothing of importance.

Examination of the left breast disclosed a firm irregular nodular tumor which in places was attached to the skin and in places was somewhat soft. The neoplasm was not adherent to the underlying structures. The nipple was retracted and adherent to the mass. No secretion could be expressed from the nipple. In the region of the left axilla there was a somewhat larger mass which in some areas was firm and in others soft and distinctly fluctuant. This mass was fixed to the skin and the deeper structures. Roentgen examination of the chest revealed clouding of both apices, signs of bilateral basal pleurisy, calcified hilus glands and a marked increase in the pulmonary markings.

Because of the previous failure of conservative measures, radical resection of the breast with removal of the axillary structures was done. Section of the breast revealed areas of fibrosis containing small abscess cavities without definite areas of caseation. Inoculation of a guinea pig with material obtained from the breast showed tuberculosis. Histological examination of the tissue disclosed four

different types of reaction: (1) typical tuberculous lesions showing little tendency toward caseation and readily going on to sclerosis; (2) areas of diffuse lymphocytic infiltration particularly around the acini and blood vessels; (3) areas of diffuse sclerosis with small inflammatory foci; and (4) distinctly granulomatous areas rich in blood vessels with but few specific elements.

The author reviews the literature and discusses the pathogenesis of tuberculosis of the breast. He concludes that in the case reported the infection was retrograde from the axillary lymph glands to the breast. He believes that the breast is ordinarily resistant to infection by the tubercle bacillus and that tuberculosis of the breast is relatively benign and may be cured by excision. Radical excision is to be preferred because it removes all of the involved lymph channels but in cases of early circumscribed lesions in young girls in whom cosmetic results are desirable local excision may be attempted. Care should be taken during the operation to prevent contamination of the surrounding tissues.

PETER A. ROSE, M.D.

TRACHEA, LUNGS AND PLEURA

Stivers G L: Closing of Tuberculous Lung Cavities by Intrapleural Pneumolysis. *New Eng Land J Med* 1933 CIVIL 469

Extensive adhesions in the chest may be removed by wide thoracotomy but this operation is done only in exceptional cases. The procedure of choice in most cases is closed intrapleural pneumolysis which is performed through a small puncture wound in the chest wall with the aid of the thoracoscope. The thoracoscope is usually introduced at the sixth or seventh intercostal space about 3 in. from the spine. The cautery is inserted through the chest wall at a site depending upon the location of the bands to be cut.

The most common varieties of adhesions are

1. String like bands, small in diameter varying considerably in length, white and shiny and devoid of blood vessels and lung tissue. These are the type most often seen at operation. They are usually located in the lower two-thirds of the chest cavity.
2. Heavy very fibrous bands which are round and short and usually contain lung tissue to within a short distance of their insertion in the chest wall. Their origin is frequently a cavity in the lung. They usually occur in the upper third of the pleural cavity and can be reached if the cautery is introduced in the third interspace at the anterior axillary line.
3. A broad fan-shaped adhesion which is usually quite fibrous varies in thickness but is exceedingly

broad is attached to a large area of the chest wall, and contains numerous blood vessels.

Not all of the bands seen through the thoracoscope can be severed. Anterior and posterior adhesions are often located so near the mediastinum and its great vessels that cauterization is contra-indicated.

The author reports a series of twenty cases in which artificial pneumothorax and intrapleural pneumolysis gave favorable results.

JOHN H. GARLOCK, M.D.

Alexander J.: Total Pulmonary Lobectomy: A Simple and Effective Two-Stage Technique. *Surg. Gynec. & Obst.* 1935 104, 652.

The difficulty of the technical problems connected with total lobectomy is evidenced in the mortality of 53.4 per cent in 127 cases collected by the author in which recent improvements in technique were not applied. Alexander reports 18 cases in which there were 3 deaths, a mortality of 16.6 per cent, and describes the technique whereby the mortality was lowered.

The 4 types of lesions to which pulmonary lobectomy is particularly applicable are the common central type of bronchiectasis and extensive pulmonary abscesses which are sometimes associated with bronchiectasis.

Therapeutic measures such as parenthectomy, a modified sanatorium régime, postural drainage, and conservative treatment of sinus infections should be carried out prior to the lobectomy.

Just before operation a dose of morphine without atropia which will not abolish the cough reflex is given. The patient is placed in a 15-degree Trendelenburg position on the operating table and under local anesthesia the sixth, seventh, and eighth ribs are resected from the tips of the transverse vertebral processes to the posterior axillary line. Nitrous oxide and oxygen are then given under positive pressure through a snugly fitting mask and the parietal pleura is widely incised. If pleural adhesions over the diseased lobe seem separable, the exposed parietal pleura between the fifth and ninth ribs is completely excised to give free exposure of the lung.

If the adhesions investing the lobe seem tough and their division is difficult and slow the operation is abandoned and Graham's cautery pneumectomy is carried out.

If the adhesions are friable, the lobe is entirely freed by finger dissection up to, and including, the interlobar fissure. The next step is very gentle stroking of every portion of the mediastinal, costal, diaphragmatic, and visceral pleura (except that of the diseased lobe) with dry gauze held on the fingers. Such stroking of the pleura produces a protective barrier of sterile traumatic inflammatory exudate on and under the pleura and causes the formation of firm adhesions between the entire lung and its investing parietal pleura. As a result, the mediastinum becomes "stabilized." After completion of the stroking the wound is closed tightly in layers.

The traumatic effusion which ensues may either be aspirated or removed by means of a fenestrated tube brought out through a stab wound. The free end of the tube is anchored beneath a sterile solution in a bottle.

After the first stage postural drainage is continued and only enough opiates are given to relieve the pain without abolishing the cough reflex.

Twelve days later the second stage of the operation is carried out under nitrous oxide-oxygen anesthesia induced under positive pressure to keep the newly adherent undiseased lobe from retracting from the thoracic wall. The wound is re-opened digitally the diseased lobe freed from its adhesions, and a liver needle threaded with 80 cm. of heavy braided silk passed through the hilum of the diseased lobe. The suture is divided and each half of the hilum ligated tightly with the respective segment of silk before each pair of ligatures is made to encircle the entire hilum. A catheter with its distal end clamped is introduced into the lower pleural cavity alongside the lung for intermittent insufflations of Dakin's fluid, and the incision is tightly closed.

After two or three days the incision is re-opened and the pleural space around the gangrenous lobe is loosely packed daily with acriflavine gauze until the lobe falls away spontaneously.

Other modern methods of lobectomy are critically considered. The author believes the success of the operation depends upon meticulous pre-operative, operative and postoperative care.

FRANKLIN E. WATSON, M.D.

ESOPHAGUS AND MEDIASTINUM

Fräncel J.: Removal of Foreign Bodies from the Esophagus by Means of External Esophagotomy (Beitrag zur Frage über Entfernung der Fremdkörper aus der Speiseröhre mittels ausserer Esophagotomie). *Verh. chir. Arch.*, 1935 XIV 350.

The author bases his discussion on 123 cases, 71 of which have been published in the literature since 1915 (Hacker's statistics). 69 of which were reported to him in replies to a questionnaire sent to Russian surgeons, and 2 of which were his own.

For the removal of swallowed foreign bodies from the esophagus non-operative and operative methods are employed. To the first belong (1) procedures in which the foreign body is removed through the mouth with various instruments or is pushed down into the stomach (2) removal under X-ray control and (3) removal by means of the esophagoscope. To the operative group belong (1) pharyngotomy (2) lateral tracheotomy (3) cervical and thoracic external esophagotomy and (4) gastrostomy.

In some of the cases reviewed the older methods, bringing up of the swallowed foreign body by means of various specially constructed coin catchers and esophagus forceps and hooks or pushing it down into the stomach by means of knob bougies, were successful. However these procedures are associated with such great danger (injury of the oesophagus)

phageal wall with subsequent fatal mediastinitis) and are so often unsuccessful that they are now usually avoided.

Removal of the foreign body under X ray control deserves more consideration as to a certain extent the entire procedure can be carried out under direct observation. Nevertheless, this method should be limited to the removal of foreign bodies with smooth surfaces. It should not be used for the removal of impacted objects with sharp-pointed edges or ends.

The great majority of foreign bodies may be removed with the oesophagoscope. However this method fails in from 5 to 9 per cent of the cases and has a mortality of from 7 to 8 per cent even when it is used by experts. It should be employed only by specialists who have thoroughly mastered the art of oesophagoscopy.

In a case of foreign body with sharp edges (bone or dental prosthesis), external oesophagotomy must be performed immediately if one or two attempts at oesophagoscopy are unsuccessful. When an oesophagoscope is not available as may be the

case in rural districts operation should be performed as soon as the diagnosis is made without losing the time necessary to transport the patient to a specialist.

When external oesophagotomy is performed before the onset of complications it has a relatively low mortality (7 to 8 per cent). In the 142 cases reviewed by the author the operative results were recovery in 123 cases and death in 19 cases (13.4 per cent). The operation is classed as an emergency procedure and is regularly carried out as such in surgical centers.

In conclusion the author warns against unnecessary operation for the removal of a swallowed foreign body and recommends that immediately before operation is undertaken an examination be made to determine whether the foreign body is in the oesophagus. He states that there are numerous reports of cases in which a foreign body known to be in the oesophagus the night before the operation was found at operation the next day in the lower part of the gastro-intestinal tract. G. AUROS (7)

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Koonz, A. R.: Preserved Fascia in Hernia Repair with Special Reference to Large Postoperative Herniae. *Arch Surg* 1933 xxvi, 500.

The author reports a method for the repair of large postoperative hernia by the use of animal fascia preserved in alcohol. Following excision of the hernial sac the defect is closed by a running suture of strips of autogenous fascia lata. When the hernia is so large that the defect cannot be completely closed by approximating the fascial edges with these strips, closure is effected so far as possible with a running suture of preserved ox fascia; a free sheet of preserved ox fascia is sutured into the remaining defect by a continuation of the same stitch and a lacework re-enforcing suture line of fascial strips is placed over the implant. In the case of obese persons, serum tends to collect between the fat and fascia. Therefore in such cases the author establishes drainage through a stab wound in the flank made in the most dependent portion of the undermined area.

JOHN H. C. VANCE, M.D.

GASTRO-INTESTINAL TRACT

Cumani M.: Experimental Studies of Gastric Plication (*Ricerche sperimentali sulla plicatura gastrica*). *Chir. clin.* 1933, viii, 1500.

Gastric plication may be useful as a supplement to gastro-enterostomy. To ascertain whether it has any harmful effects on the function of the stomach, Cumani performed it in nine dogs and then examined the stomach histologically. He presents photographs and photomicrographs made in the cases of some of the animals. As he found the operation to be simple and without disadvantages, he concludes that it may well be included in the surgery of circumscribed morbid processes of the stomach in man.

ROBERT T. LEON, M.D.

Martsdoff K. H. and Sackow G. R.: Wound Healing in Anterior Gastro-Enterostomy Following Various Methods of Suture. An Experimental Study in Dogs. *Arch Surg* 1933, xxvi, 345.

In experiments on forty two dogs seven suture methods were used in doing a gastro-enterostomy or gastrojejunostomy. The suture material was No. 0 silk or No. 00 catgut. After the operation the dogs were given water as soon as they were able to tolerate it. On the fourth day milk and hamburger steak were added to the ration. On the sixth day ordinary kenneled food, milk and dried horse meat were given. No attempt was made to shield the gastro-intestinal wound from contact with coarse foods. The animals were killed with chloroform ana-

nine fourteen, twenty and twenty-seven days after the operation and necropsy was performed immediately.

The objects of the experiment were to determine the state of wound healing and the degree of inflammation after the different methods of suture to note whether serosal inclusions or cysts, which for brevity are termed "appositional rests," would form on apposed serosal surfaces of the gastro-intestinal anastomosis and to determine whether structures called mucosal rests or inclusions which are found in the operative area usually on the intestinal side of the anastomosis and only after the use of silk ligatures were present.

The types of suture were the following:

Method 1: The Connell suture a continuous through-and-through mattress suture of catgut.

Method 2: After the first tier of silk was placed, the stomach and intestines were incised and a continuous suture of catgut was placed as a through-and-through lock stitch or buttonhole suture incising the entire thickness of both walls.

Method 3: A continuous suture of catgut was passed from side to side the so-called "baseball stitch."

Method 4: This was the Halsted presection method, consisting of a single row of presection Halsted sutures of silk.

Method 5: This was a continuous second suture of catgut passed through all of the coats of the stomach and intestine after they had been incised.

Method 6: The first suture was a continuous suture of silk. The stomach and intestine were then incised down to the submucosa and a continuous suture of catgut was placed through the serosa and muscularis, care being used not to pierce the mucosa. The mucosa was sutured with a continuous suture of catgut.

Method 7: This was the same as Method 6 except that the mucosa was not sutured, hemorrhoids being effected by ligation of individual bleeding points.

The most rapid and uncomplicated healing was obtained by the use of a single layer of seromucosal presection silk sutures (Method 4). This fact was interpreted as indicating that separate suture of the mucosa is not only unnecessary for rapid mucosal healing, but is probably a retarding factor and therefore undesirable. The next most rapid healing occurred after the use of Methods 1 (Connell suture), 3 (baseball stitch) and 6 (three-tier suture).

From the standpoint of firm union along the line of apposition there was very little difference. In some of the specimens of early healing after the use of Method 5 (ordinary continuous suture) most

marked inflammatory changes were discovered. Mucosal healing was most rapid following the use of Method 4 (one layer presection suture). It occurred next most quickly mentioned in order of decreasing rapidity after Methods 3, 6, 5, and 1. Between the results of Methods 6, 5, and 1 there was little difference.

When the mucosa had been pierced by a silk suture mucosal inclusions developed in the intestinal wall. Eversion of the mucosa was found to cause displaced epithelium to develop in the line of gastroduodenal apposition and occurred frequently after the use of Methods 3 and 5.

The best healing of the posterior aspect of the gastroduodenal ostium was obtained after an inner row suture passed through all of the coats of the stomach as an ordinary continuous stitch or after a similar stitch passed through the serosa and submucosa, the cut edges of the mucosa being left free.

Nothing that could be interpreted as a serosal inclusion was observed in this study.

SAMUEL J. FOOTE, JR., M.D.

Velver, M. A.: *Acute Intestinal Obstruction*. Third Installment. *Am. J. Surg.*, 1933, 218, 579.

The common sites of internal hernia are the intra-abdominal fossa, which occur most frequently in the region of the ligament of Treitz in the so-called foramen duodenojejunalis and in the region of the junction of the ileum with the caecum. Rarely an internal hernia is found in relation to the sigmoid in the intersigmoid fossa formed by the opening in the mesocolon occurring on the left side of the sigmoid over the bifurcation of the iliac vessels. Extremely rarely the bowel may herniate into the lesser peritoneal cavity through the foramen of Winslow. Herniation may occur also through the diaphragm and through openings in the mesentery, omentum, and broad ligaments of the uterus. Such openings occur most frequently in the mesentery of the lower ileum and are usually circumscribed by an anastomosis between the ileocolic branch of the superior mesenteric artery and the last of the intestinal arteries.

Congenital anomalies which may cause intestinal obstruction are of three types: (1) stenosis, (2) defects in rotation which may cause volvulus, and (3) Meckel's diverticulum.

Of the 355 cases of intestinal obstruction reviewed by the author a gall stone was responsible for the obstruction in 5. Gall stones large enough to produce ileus usually gain entrance to the intestinal tract by rupture from the gall bladder into the gut. They produce ileus either because of their size or because they incite a spasm of the intestinal musculature. Gall-stone ileus occurs much more frequently in females than in males. Of the 5 patients with this condition whose cases are reviewed by the author all were females. The symptoms may be acute in the beginning but are often subacute for a number of days or weeks before they become acute.

Acute Intestinal obstruction may be caused also by accumulations of food, foreign bodies such as hair balls and pieces of wood, enteroliths composed of inorganic salts, intestinal parasites, especially *ascaris lumbricoides*, and bismuth and barium administered by mouth for examination of the gastro-intestinal tract.

ALTON C. GIBBS, M.D.

Åkeclund, Å.: *Direct Roentgenological Diagnosis of Tumors of the Small Intestine* (Zur direkten Roentgendagnostik der Dünndarmtumoren). *Acta chirurg. Scand.*, 1932, 131, 1.

Heterotopie X-ray examination was of little value in diseases of the small bowel until the stage of stenosis was reached and even then it permitted only recognition of the presence of the ileus and not the cause. Recent advances in roentgenological technique now permit a diagnosis of tumor of the small bowel at a relatively early stage before the phenomena of obstruction have appeared. The diagnosis is based on a careful study of the shadow cast by the rugae of the bowel. Such examination with the aid of a contrast medium is indicated whenever persistent melena or symptoms of obstruction are present and ordinary X-ray studies of the stomach and colon are negative. The opaque medium is usually administered by mouth and its passage into the small intestine is facilitated by massage and having the patient lie on the right side. Frequent fluoroscopic observations are made and serial roentgenograms are taken when indicated.

The author reports four cases with positive roentgenological evidence of tumor infiltration of the small bowel without obstruction. The neoplasms were a hemangiosarcoma of the jejunum, an adenocarcinoma of the colon with an ileocolic fistula



Fig. 1. Hemangiosarcoma of the jejunum.



Fig. 3. Lymphogranulomatosis of the small intestine.

adenocarcinomatosis of the peritoneum and small intestine, and lymphogranulomatosis of the small intestine. The diagnoses were confirmed at operation.

The principal local roentgenological signs of tumor infiltration of the small intestine are a change of the normal mucosal relief in a circumscribed segment, rigidity and inelasticity on palpation, tenderness and palpable resistance at the site of the neoplasm, a constant filling defect, niche formation with persisting patches of opaque substance, and local prestenotic pseudo-diverticula formation. The roentgenological differential diagnosis between tumors and tuberculous infiltration, tuberculous strictures, adhesion strangulations, and normal peristaltic shadows is briefly described.

LEO M. ZIMMERMAN, M.D.

Weber H. M.: Carcinoma of the Colon: Its Roentgenological Manifestations and Differential Diagnosis. *Am. J. Cancer* 1935, xvii, 511

Roentgenological examination is essentially a special method of determining only those features of disease which are apparent to the eye and hand on direct examination of the specimen.

Carcinoma is by far the most commonly encountered malignant lesion of the colon. Sarcoma is extremely rare. Its gross features usually indicate its malignant nature, but a definite diagnosis is possible only by microscopic examination.

Morphologically carcinomata of the colon may be classified into the following three groups (1)

scirrhous or fibrocarcinoma, (2) medullary or polypoid carcinoma, and (3) mucoid or gelatinous carcinoma.

The earliest roentgenological examinations of the large intestine were carried out with the use of the opaque meal. It is now generally agreed that this method is incapable of yielding adequate information regarding organic lesions although it is indicated in special instances. The investigative procedure of choice depends upon the method which will best demonstrate the deformity. The method demonstrating the deformity with maximum efficiency is the use of the opaque enema.

Among the most valuable diagnostic procedures is a study of the relief patterns assumed by the mucosa of the intestine covered with a thin coat of opaque material.

In special instances, when for some reason the use of opaque salts may be contra indicated, inert gases may be used. It is possible to obtain a satisfactory outline of the colon by insufflation, but the picture lacks the distinctness necessary for accurate diagnosis.

The significant roentgenological features of lesions of the colon are their intraluminal situation and their failure to produce a roentgenologically demonstrable deformity in the contours of the colon. When the tumor is large and situated in a segment of the colon which is accessible to palpation, roentgenoscopic examination will give reliable evidence of its presence.

The diagnosis of carcinoma of the colon requires the demonstration of a filling defect. The filling defect is produced chiefly by protrusion of the growth into the lumen of the bowel, but partly also by the decrease in the distensibility of the infiltrated intestinal wall. The roentgenological picture is in fact the shadow of a barium cast made with the lumen of the bowel as a matrix. When the outline of the colon distended with contrast material is found to be irregular the examiner must determine first whether the defect observed has an anatomical basis or is due to causes without an anatomical basis such as local accumulations of gas, fluid and fecal matter in the colon.

Diverticulitis is encountered practically only in the region of the sigmoid. Hyperplastic tuberculoz, amebic granuloma, and mycotic affections of the bowel are designated as "specific granulomata." They are much more readily distinguished from carcinoma than from each other or from non-specific granulomatous lesions.

Rarely chronic ulcerative colitis, specific or non-specific, involves only a short segment of the colon. Organic stricture is exceedingly uncommon except as a complication of chronic ulcerative colitis.

Early diagnosis of carcinoma of the colon is important. All changes in intestinal habit are indications for a thorough roentgenological investigation of the intestinal tract. The author suggests that such an investigation might be included in routine yearly examinations.

Finney J M T., Jr: Appendicitis: Some Observations Based on a Review of 3 913 Operative Cases. *Surg., Gynec & Obst.*, 1933 14, 360

The author includes in his discussion only cases in which there was a fairly definite history of 1 or more attacks, definite disease of the appendix was found at operation, and the appendectomy was not complicated by other operative procedures. On the basis of the history and the operative findings he divides the cases into the following 6 groups: (1) chronic cases in which there was a history of discomfort rather than of a definite sharp attack and cases without more than 1 acute flare up, (2) chronic recurrent cases with 2 or more definite attacks and an interval operation (3) subacute cases in which operation was performed during or immediately after either a mild attack or an attack which was definitely subsiding (4) acute cases without rupture of the appendix in most of which gangrenous changes were found, (5) cases with rupture of the appendix and abscess in which there was evidence of an attempt to wall off the infection and (6) cases of ruptured appendix with peritonitis and little or no tendency toward walling off of the infection.

The mortality among males was 3.32 per cent and the mortality among females 1.26 per cent. The total mortality was 2.325 per cent. In the cases operated upon by the house staff the mortality was slightly higher than in those operated upon by the visiting staff. The difference is attributed to the fact that among the cases operated upon by the house staff there were 20 per cent more cases with rupture of the appendix. In the cases of ruptured appendix operated upon by the house staff the mortality was practically the same as the mortality in the cases operated upon by the visiting surgeon who had the largest number of cases and the widest experience.

The incidence of rupture of the appendix decreased from 45.8 per cent in the period from 1900 to 1905 to 18.7 per cent in the period from 1926 to 1930. These figures are exclusive of the chronic and chronic recurrent cases. In spite of the decrease the fact that rupture of the appendix occurs before operation in 1 out of every 5 cases indicates that considerable improvement is necessary in the diagnosis and treatment of acute appendicitis.

In an attempt to determine the reasons for the frequency of rupture of the appendix Finney investigated the frequency of the administration of cathartics in cases of abdominal pain. He found that cathartics had been given in from 30 to 60 per cent of cases of acute or subacute appendicitis which did not terminate fatally in 30 per cent of the fatal cases of acute appendicitis without rupture of the appendix, in 85 per cent of the fatal cases with rupture and abscess, and in 73 per cent of the fatal cases with rupture and peritonitis. Another factor of importance in the incidence of rupture of the appendix is the time at which the diagnosis of appendicitis is made. Physicians should be able to recognize not only the more typical cases but also cases in which

the cardinal signs are absent. The findings of most aid in the diagnosis are a localized point of tenderness and a relative increase in the polymorphonuclear leucocytes. The leucocyte count as a whole is higher in the acute cases but is not an infallible index of the severity of the inflammatory process. In all of the cases reviewed except those of acute appendicitis without rupture of the appendix the counts averaged slightly less in the cases of males than in those of females.

A third important factor in the incidence of rupture of the appendix is the time which elapses between the onset of the symptoms and operation. Rupture may occur within forty-eight hours. In 2 cases reviewed it occurred within six hours. In the cases with peritonitis the mortality was 225 times the mortality in the chronic and chronic recurrent cases. Rupture of the appendix increases also the length of time the patient is obliged to stay in the hospital and therefore the cost of his illness.

E. S. PLATT, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

D'Amato Pascale and Chiariello: Chronic Hepatitis, Including Cirrhosis (Epatiti croniche comprese le cirrosi). *Clin. chir.* 1932 viii 1443
1453

After reviewing the pathology of the different forms of chronic hepatitis and emphasizing the importance of a functional examination of the liver in surgery, the authors discuss the different surgical operations in the treatment of chronic hepatitis. The latter include Talma's operation which is successful in about 50 per cent of the cases, the formation of an Eck fistula and Ruotte's operation which consists in grafting the sphenous vein into the abdomen. Bogovaz proposed suturing the peripheral end of the inferior mesenteric vein into the inferior vena cava and has had some successful results from this procedure. Others have proposed continuous drainage of the ascitic fluid. Lambotte suggested capillary drainage with fine silk threads.

All of these surgical methods rest not only on the mechanical factor of ascites, and while such action is of value the ascites is after all, only the result of the cirrhosis. The severity of the ascites depends upon the condition of the liver cells and the reticulo-endothelial cells. Surgical operation is indicated for the ascites only if the cirrhosis is not very far advanced the liver responds fairly well to functional tests, and the function of the other organs is not very seriously affected. If there is any suspicion that the cirrhosis is syphilitic, anti-syphilis treatment should be tried before operation is considered. As patients with cirrhosis are usually in poor condition to withstand a serious operation, surgery should always be associated with medical treatment to improve the condition of the liver cells.

Cirrhosis of the liver is due to various causes. Neither the pathological nor the clinical picture is

uniform in all cases. Accordingly each case must be studied individually. If there is reason to believe that the condition is caused by cholecystitis and angiocholitis, an operation on the large bile ducts may be tried. However serious harm may be done by too long deviation of the bile from the intestine. In cirrhosis of the liver associated with splenomegaly splenectomy has sometimes been successful.

ARMY GORE MORGAN, M.D.

Gohrbandt: Anastomosis of the Gall Bladder to the Stomach and Intestine (Anastomosen der Gallenblase mit dem Magen und Darmkanal). *Zentralbl. f. Chir.* 1931 p. 2700.

Anastomosis of the stomach to the intestinal tract has been done for about forty-five years. Nussbaum was the first to perform the operation, and Wintharper and Capeller repeated it a few years later.

Anastomosis of the gall bladder to the stomach and intestinal tract is the method of choice in all irreducible benign or malignant strictures of the common duct and the papilla of Vater. The most favorable point of implantation, when there is no difficulty in performing the operation there is the duodenum as anastomosis at this site most closely approximates the physiological relationships. When the anastomosis cannot be made in the duodenum it may be made anywhere except in the transverse colon. The transverse colon is unsatisfactory because it has a high bacterial content and because a large part of the bile cannot be used.

The indications for the operation are stenoses and strictures of the common duct and the papilla of Vater which cannot be overcome by other means. Gohrbandt extends the indications to stones impacted in the common duct and the papilla of Vater especially when removal of the stones would be a particularly difficult procedure which could not be borne by the patient. Gohrbandt obtained good results in thirteen such cases. The first of the operations was performed seven years ago. Good results depend upon the evacuation of the bile. In addition, the author obtained good results from cholecystoduodenostomy in cases of hepatic stones.

In conclusion, Gohrbandt mentions another indication for this operation. In the examination of patients who have been subjected to cholecystectomy he has found that, even when no technical errors were made, from 6 to 6 per cent complain of severe postoperative symptoms which are merely a continuation of their previous symptoms. It is interesting that these are precisely the cases in which few or no pathological changes could be demonstrated in the gall-bladder wall. Perhaps a harmless-looking little stone was found in the removed gall bladder. Gohrbandt has performed cholecystoduodenostomy in thirty cases in which no pathological process was evident in the wall of the gall bladder. To date the patients have remained free from symptoms.

In the discussion of this report HENYMAN confirmed Gohrbandt's observations concerning chole-

cystectomy with no gall-bladder findings. He stated that he had seen many similar cases, and when his patients continued to have pain he re-operated upon them if they desired it. He was never able to find any obstruction or any explanation for the colic except a certain amount of stasis in the region of the bile ducts. If at the second operation he provided for the outflow of bile by hepatoduodenostomy and gastro-enterostomy the symptoms were relieved.

PETERMANN advised caution in the determination of the indications for anastomosis of the gall bladder and the gastro-intestinal tract in cases of impacted stones in the common duct or the papilla. He stated that the anastomosis of the cicatricially contracted gall bladder may be very difficult or impossible and the gall stones themselves may produce symptoms.

BIXA warned against useless re-operation which frequently aggravates the symptoms, and recommended the liver preparation "cholemon" which he has often found of value.

E. TRAUM (Z)

Quick, B.: Acute Pancreatitis. *Australian & New Zealand J. Surg.* 1932 2, 115.

The incidence of acute pancreatitis is considerably higher than is generally believed.

During the past four years 49 proved cases were admitted to the Alfred Hospital, Melbourne—1 case in every 378 admissions. During the same period, 65 patients with perforated peptic ulcer were admitted. This ratio roughly approximates that reported by Schmieden and Sebenius of the Frankfurt Clinic—38 cases of pancreatitis to 63 cases of perforation.

The view that the primary lesion, necrosis of the pancreatic cells, is due to activation of ferments *in situ* is very generally held. The division of opinion occurs between those who accept the teaching of Mangeret, Deaver, and Mann that the cellular and other products of lymph-borne infection constitute the activating agents, and those (the majority) who believe that the process is one in which some mechanical defect (blockage) or physiological error (spasm) at the biliary outlet brings about a reflux of bile into the pancreatic duct. This view may be referred to as the "canalicular" theory of origin.

In support of the canalicular theory of origin of pancreatitis as opposed to the theory attributing the condition to a lymph-borne infection, the author cites the following observations:

1. The high incidence of associated cholelithiasis (from 50 to 70 per cent according to various reports 61 per cent in the cases reviewed).

2. The ease of production of experimental pancreatic necrosis following the forcible injection of sterile normal bile into the duct by syringe or the introduction of abnormal bile (infected, concentrated, mucus-free) under a pressure approximating the physiological maximum.

Of the 49 patients whose cases are reviewed, 29 were females. The ages of the patients ranged from fifteen years (male who died) to seventy-two years (male who recovered). Gall-bladder stones were

present in 61 per cent of the cases duct stones in 12 per cent and stones impacted at the ampulla in 6 per cent.

In several instances the common duct was found considerably distended without any demonstrable stone yet the bile which escaped on incision of the duct carried with it mucinous flakes or flocculi.

Acute pancreatic edema was found in 18.4 per cent of the cases. This is manifested by a glassy edema of the subperitoneal tissues over the pancreas and in the immediate neighborhood of the visible bile passages. The edematous fluid may be bile stained and there may be a peritoneal effusion similarly tinged. Microscopic sections show no hemorrhage or necrosis of the pancreatic cells. The condition is analogous to that which Archibald produced in cats by introducing clean bile from the gall bladder of the cat into its pancreatic duct. Archibald has suggested that acute edema of the pancreas may explain many attacks of pain of doubtful origin in the upper half of the abdomen.

Acute hemorrhagic pancreatitis (acute cellular pancreatic necrosis) was found in 69.4 per cent of the cases reviewed. The striking features are the occurrence of fat necrosis a lipase saponification of the fatty tissues to which the ferment has gained access and more or less hemorrhage involving the pancreas and peritoneal cavities.

Acute gross pancreatic necrosis and suppurative pancreatitis were found with equal frequency in 12.2 per cent of the cases. In every instance the condition was discovered at autopsy. At laparotomy performed three days after the onset of the illness in 1 of these cases pancreatic edema was found. The only treatment instituted was the insertion of a tube drain to the pancreas. No biliary decompression was done. Autopsy two days later showed that the lesion had advanced to inflammation and necrosis of the head of the pancreas. The fact that in no instance was a definite suppurative process found in the pancreas before the lapse of twelve days suggests that bacterial invasion was not the direct cause of the primary condition. In confirmation of this theory is the fact that in no case in which operation included a satisfactory biliary decompression but death resulted later was any more advanced lesion of the pancreas demonstrated at autopsy than was noted at operation. On the contrary the pancreas seems to have remarkable powers of repair.

It is significant that no gross pancreatic necrosis has been unexpectedly revealed at operation or autopsy since the urinary diastase has been routinely estimated in all cases of acute infection in the upper part of the abdomen.

In most cases of pancreatitis there is a history of previous attacks of pain generally ascribed to gall stones and often accompanied by jaundice. In 4 of the cases reviewed by the author an operation had been performed on the biliary tract. Of the 4 cases without premonitory symptoms, death occurred in 2. In the other cases, mild attacks of pancreatic edema may have been experienced.

The most important symptom is an agonizing pain in the upper part of the abdomen which may be continuous or recur in increasingly severe attacks of colic and is seldom, if ever, relieved by morphine. Especially significant is epigastric pain radiating to the left hypochondrium and the back loin or shoulder. In the author's opinion the pain is due to increased intraductal pressure and is comparable in origin and severity to biliary and renal colic.

Tenderness is always present and is usually maximal in the epigastrium. It is most significant when it is more pronounced in the left hypogastrium flank or loin. When it is combined with tenderness in the right hypochondrium an associated gross cholecystic disease is probably present.

Vomiting occurs in a variable degree in practically every case.

Other signs and symptoms are extraordinarily protean. Rigidity of the upper abdomen is commonly present in some degree but sometimes may be completely lacking. Collapse is not constant at the outset. Constipation and inability to pass flatus after enemata may lead to a diagnosis of intestinal obstruction although distention is rarely general. Slight jaundice has been noted. Peculiar to the disease is a slight cyanotic tint most obvious in the face. Loewe's sign has been found entirely unreliable but the estimation of the urinary diastase has not failed to confirm or refute a clinical diagnosis of acute pancreatic disease.

The diagnosis depends upon the history and a study of the symptoms and signs mentioned. The possibility of acute pancreatitis must be borne in mind in the examination of all patients with an acute condition developing in the upper part of the abdomen. Acute pancreatitis is confused most frequently with acute cholecystitis, perforated peptic ulcer, intestinal obstruction, acute appendicitis, diaphragmatic pleurisy and perforation of the gall bladder.

It is impossible to avoid the conclusion that timely treatment of pre-existing chronic biliary disease would have saved many of the patients who died. In 1 instance the attack occurred between the roentgen demonstration of non filling of the gall bladder and the patient's admission to the hospital for operation. In 4 cases a previous operation on the biliary tract had been performed. In none of these had operation been complete and satisfactory for in 2 of them a common-duct stone was found, in 1 cholecystectomy was impossible and in 2 the ducts were not explored when a calculous gall bladder was removed. The author rejects the widely accepted teaching that cholecystic disease should not be operated upon until the acute symptoms have subsided as he believes that many disasters have followed non recognition of pancreatitis and valuable time has been lost in palliative and expectant treatment.

The canalicular theory of origin of pancreatitis as opposed to the theory attributing the condition to lymphatic infection is supported by the following facts:

1. It is difficult to reconcile the sudden onset in many cases or a history of remissions and intermissions with an inflammatory process.

2. The not very rare localization of the disease to the tail of the pancreas with exemption of the head speaks against lymphatic spread from the gall bladder.

3. Relief of pain follows decompression of the duct system.

4. Dilatation of the gall bladder and common duct is frequently seen both at operation and autopsy even in the absence of common-duct stone.

5. Direct evidence of biliary extravasation has been observed in the peritoneal effusion and in the pancreatic duct and parenchyma. Moreover in 1 case bile continued to be discharged from a sloughing pancreas at a time when the cholecystostomy was demonstrated on further operation to be healed.

Because of these facts the primary aim of surgical treatment should be biliary decompression which, by preventing further retrojection of an abnormal bile into the pancreas, will limit pancreatic damage.

At present surgery can do little or nothing to avert the consequences of the free shedding of activated ferments into the areolar tissues around the pancreas. Only in cases in which gangrene abscess or total slough of the pancreas has occurred or seems

inevitable is peritoneal incision over the pancreas advisable.

In the author's opinion, the aims at operation should be (1) to free both the greater and the lesser sac of effusion, particularly effusion which is blood stained, (2) to bring about a satisfactory biliary (and thus pancreatic) decompression, usually by opening, exploring, and draining the common duct, and (3) to remove the gall bladder unless the patient's condition makes prolongation of the operation unwise.

Cholecystostomy is less satisfactory for biliary decompression than opening of the common duct, but may be necessary because of old adhesions or huge swelling of the head of the pancreas.

The indication for cholecystectomy is relative. This operation is concerned with the future welfare of the patient and may be postponed.

When gross necrosis or a frank suppurative process is found in the pancreas, general surgical principles should be followed.

In conclusion the author says that earlier diagnosis followed by suitable operative treatment in cases of acute pancreatic necrosis will result in a decrease in the present mortality of approximately 50 per cent (his own cases, 38 per cent).

J. EDWIN KIRKPATRICK, M.D.

GYNECOLOGY

UTERUS

Schiller W: Early Diagnosis of Carcinoma of the Cervix. *Surg Gynec & Obst.*, 1933 Vol 210.

Early diagnosis and treatment are the only means we have today of improving the results in the treatment of carcinoma. There is no doubt that early operation and the application of irradiation before wide extension of the cancer decidedly improve the prognosis. If the carcinoma is internal and therefore cannot be seen, early diagnosis is difficult and probably depends upon a general reaction yet to be discovered the presence of which may be revealed by examination of the blood urine, serum or skin. Of course if diagnosis were thus possible it would still be very difficult to find the site of the tumor. At the present time in spite of the high standard attained in the study of cancer we are far from reaching this goal. Somewhat more favorable are the possibilities of detecting carcinoma of the epithelium in areas readily examined with the eye as for instance, the skin mouth penis, vagina and cervix. In any case the main thing is to be able to make a diagnosis during the earliest stage this can be done only if patient comes for consultation during that stage.

An examination of the region immediately surrounding a large carcinoma of the cervix reveals that in most of the cases the growth is separated from the normal epithelium by a small inflammatory zone free of epithelium. Wherever the carcinoma penetrates from the surface into normal tissue there is a narrow zone of inflammatory infiltrated connective tissue not covered with epithelium or with cancer. Although in a small percentage of cases the carcinoma is in direct junction with the surrounding normal epithelium (so that the normal epithelium does not project over the downgrowth) the carcinoma forms a surrounding superficial layer of about the same depth as the normal epithelium which is definitely marked off. Schottlaender and Kermanner were the first to notice the superficial narrow layer. They called it the "carcinomatous superficial layer." Schiller has noted also that when in one spot carcinoma is marked off from normal tissue by a zone free of epithelium the growth is usually wholly surrounded by such a zone free of epithelium, and if there is a carcinomatous layer in one place the growth is always completely surrounded by such a carcinomatous layer. Obviously the kind of demarcation depends on the biological nature of the carcinoma and of the organism in which carcinoma develops.

The question arises Is this carcinomatous layer a part of the carcinoma? On the basis of the characteristics of advanced carcinoma the answer must

be in the negative for the carcinomatous layer is not superficially ulcerated and it does not invade the deeper tissue. Neither is it definitely marked off from the connective tissue nor does it show a tendency to penetrate deeply by single cells or groups of cells. From the old point of view carcinoma is diagnosed only when it penetrates deeply and then the carcinomatous layer is separated from the carcinoma and is considered a surrounding region not a carcinomatous zone. From the histological point of view, however this hypothesis is altogether wrong because the layer shows the characteristics of carcinoma—atypical and polymorphous cells and frequently numerous mitotic figures. Moreover there is no histological difference whatsoever in the area where the carcinomatous zone passes into the deeply penetrating carcinoma while there is a distinct histological difference at the point where the carcinomatous layer is marked off from the epithelium. Therefore the carcinomatous layer must be considered part of the carcinoma.

In this early type there is no downgrowth or metastasis, two phases in the development of carcinoma. However downgrowth is bound to occur. Sometimes it appears early but sometimes it may not appear for months or years. This is true also of metastases. It must be emphasized however that carcinoma does not always show downgrowth. There is an early stage of carcinoma with tissue changes characteristic of this stage of development—for instance, the cell changes the appearance of atypical and polymorphic cells—in which the growth has not begun to penetrate the deeper tissue.

The application of the term precancerous to carcinomatous layers seems to carry two different meanings. By some the term is used to designate a growth which may become a carcinoma while by others it is employed with reference to a growth which is bound to become carcinoma. As long as the term precancerous has more than one meaning it should be avoided.

As the demarcation between the carcinomatous layer and the normal epithelium is always distinct it is possible to indicate the exact point to which the carcinoma reaches and the normal tissue begins. Areas of transition are nowhere to be found nor are there transitory cells. Occasionally we can see within the normal tissue near the borderline single dark cells which, from the morphological standpoint are characteristic of carcinomata. The line of demarcation is always oblique and always proceeds so that in the basal part of the growth it reaches farther than the normal epithelium reaches on the surface, i.e. the carcinomatous layer is wider at the base than on the surface. Carcinomatous epithelium is characterized also by the fact that the superficial

layer which in normal epithelium consists of large vesicular light cells with small shrunken nuclei or rests of nuclei, is missing. This superficial layer which is typical in the epithelium of the cervix—normally the epithelium of the cervix does not show parakeratosis—is filled with glycogen as is proved by staining. As Schaffer pointed out the squamous epithelium undergoing differentiation may be transformed into horn or may collect glycogen. In the epithelium of the cervix the latter property is characteristic, and the glycogen disappears when the epithelium becomes a carcinomatous layer.

After Schiller had succeeded in determining the appearance of the earliest stages of carcinoma the question arose as to how the earliest stages could be recognized clinically. By a most careful comparison of the appearance of the macroscopic operative specimens with the appearance through the speculum it was found that to the naked eye the smallest carcinomata resemble small, white, opaque dull, sometimes also slightly wrinkled spots in the smooth white, transparent epithelium of the cervix.

With the naked eye it is impossible to differentiate between carcinomatous leucoplakia and hyperkeratotic leucoplakia. With Hinselmann's colposcope, by which the field can be strongly magnified and it is possible to examine the cervix precisely several interesting morphological details regarding leucoplakias may be discovered, but the instrument does not make it possible to distinguish with certainty between carcinomatous leucoplakia and hyperkeratotic leucoplakia. This differentiation can be made only by histological examination.

The clinical diagnosis of leucoplakia is sometimes made difficult because the affected area is so small that it cannot be easily seen with the naked eye. The colposcope often shows such areas more distinctly but as the colposcopic field of vision is relatively small, it is necessary to examine carefully the whole cervix from the external os to the fornix in order to find such leucoplakic areas. An examination of this kind requires skill and time. In a crowded out-patient department it is hardly possible to examine a cervix for such minute detail. Moreover it is no doubt true that cervixes which appear normal to the naked eye often harbor small incipient carcinomata.

Some method had to be found to locate the suspicious spots more easily and quickly. Schiller discovered such a method: vital staining with Lugol's solution. A startling revelation was made—the fact that the normal epithelium of the cervix contains in its superficial layers glycogen yet no carcinomatous epithelium. This glycogen may be stained on the slide with Best's carmalum and in the living patient with iodine potassium iodide solution. When the normal cervix is painted with ordinary Lugol's solution (iodine, 1; potassium iodide, 2; water 300) the epithelium acquires in from one-half to one minute a mahogany brown color. However in the areas in which some pathological process is present no brown staining takes place and the epithelium remains

white and unstained. Thus, diseased spots in the epithelium which escape the naked eye altogether and can be found only by systematic and painstaking examination of the cervix with the colposcope are made visible in about a minute. The technique used in painting the cervix is as follows:

A cervical speculum is placed in the vagina and from 10 to 15 c.cm. of Lugol's solution are poured out of a cup with a long spout, spread with a tampon over the cervix, and left in the vagina for about a minute. The iodine solution is then sucked off with a tampon and the cervix and vagina are cleaned of the caecum liquid and gently wiped. It is very necessary for the solution to moisten the entire cervix and that there should be no fold preventing the entrance of the liquid. If the epithelium shows an unstained spot we must be suspicious of cancer and the tissue here must be examined histologically. As a rule the presence of white unstained epithelial spots which are free from glycogen may indicate one of the following four possibilities:

- 1 The presence of carcinomatous layers or incipient carcinoma.

- 2 The presence of hyperkeratosis due to leucopoe or descurus vaginae.

- 3 The presence of hyperkeratosis due to luetic infection.

- 4 Desquamation of the upper layers of glycoecous epithelium caused by touching of the cervix with sharp instruments or rough insertion of the speculum. Such traumatic desquamations can be easily diagnosed from their form, as they resemble narrow sharp and straight-line scratches.

The decision as to the significance of the unstained spots of epithelium can be made with certainty only by microscopic examination. Colposcopic examination alone does not give sufficient evidence in all cases. As the changes involve only the superficial epithelium Schiller does not use the V-shaped exploratory excision to obtain material for histological examination. It is sufficient to scrape off a small piece of epithelium with a small spoon. Often it is possible to loosen the epithelium with the spoon and pull off a thin film with a tissue forceps. This method renders it unnecessary to proceed surgically or to suture a wound made by excision.

Painting with iodine is of value in locating the new-growth as long as it is in the stage of a carcinomatous layer. As soon as the growth ulcerates, the surface, which is nearly always necrotic, stains brown with iodine and the method is therefore not helpful. On the other hand ulcerated carcinomata are generally larger and more extensive and therefore easily visible. Moreover they are surrounded eventually by a line of demarcation of carcinomatous epithelium—a white superficial stripe around the ulceration. When a scraping is removed for diagnosis the white stripe—not the ulcerated part or the normal brown epithelium—should be scratched off. The simple erosion is covered on the surface by inflamed connective tissue, but later during the first stage of healing, it is covered by cylindrical epithelium. It

both instances the erosion has a more or less dark red dull velvety color to the naked eye. It becomes only slightly stained with iodine solution. It cannot be mistaken for the white superficial carcinomatous layers. The tissue for diagnosis should be taken from the white layers, but never from within the dark red eroded or ulcerated parts.

In conclusion the author says that if every woman would have a Lugol test twice or three times a year it would be possible to locate carcinoma of the cervix in its earliest stages and give immediate treatment that, especially with improvement in post operative roentgen irradiation, would raise the incidence of complete healing from 95 to 100 per cent. Such a routine examination would not involve great expense and would not require special instruction of the gynecologist.

CARL H. DAVIS, M.D.

Haupt W. Results of the Treatment of Cancer of the Uterus at the Gynecological Clinic of Bonn Since 1912 (Die Behandlungsergebnisse der Bonner Frauenklinik bei Gebärmutterkrebs seit 1912) *Strahlentherapie* 1932 xlv 311

Between April 1 1912 and March 31 1926 403 patients with cancer of the uterine cervix were treated at the Gynecological Clinic of Bonn. In the period from 1912 to 1915 the operability was 65 per cent. In the period from 1915 to 1926 43 per cent and in the period from 1926 to 1932 28 per cent. The author attributes the striking decrease in operability to an increase in the number of advanced cases with a simultaneous increase in the total number of patients admitted to the hospital.

In the period from 1912 to 1915 operation was done in all operable and borderline cases whereas in the period from 1915 to 1926 it was done in only 89 per cent. In the period from 1926 to 1932 in 15 per cent and in the period from 1932 to 1936 in 38 per cent. In recent years X ray or radium irradiation has been employed regularly after operation whereas formerly irradiation was not always used. Of the patients subjected to operation 89 per cent were operated upon by the abdominal route and 11 per cent by the vaginal route. In most of the in operable cases the treatment consisted of irradiation. In the period from 1912 to 1915 X ray therapy alone was used, but since 1915 both X ray and radium irradiation have been employed.

Roentgen ray treatment is given with a filter of 0.7 mm. of copper and 1.0 mm. of aluminum and a distance of 30 cm. The exposed field measures 20 by 25 to by 15 by 6 by 8 or whatever is necessary to meet the anatomical requirements. The voltage is 170 kv. and the amperage 4 ma. Each field usually receives a skin dose of 500 r. The irradiation is completed in one day or on two or three successive days. The treatment is repeated after three months and again after nine months, sometimes with a dose of 300 r. The first irradiation is given about eighteen days after the operation.

For radium irradiation, 45 mgm. of radium element are usually applied for from forty-eight to

fifty-four hours. It is filtered with 1.2 mm. of brass. The treatment is repeated once or twice but not before ten days after the first treatment. Within three, or at the most six weeks, from 6,000 to 6,500 mgm. hrs. of radium irradiation are delivered. Since 1925 a larger amount (from 80 to 105 mgm.) of radium element has been used and the time of application has been proportionately decreased. For fractional irradiation an average of 2,000 or at most 3,000 mgm. hrs. is given. When possible the radium is applied not only in the cervical canal but also in the corpus of the uterus. The dosage is such that the uterus receives about two thirds and the vagina one third of the irradiation. Recently from 120 to 200 mgm. hrs. of radium have been applied directly to the operative field after surgical removal.

Of 350 cases treated in the period from 1915 to 1926 the incidence of cure was 41.6 per cent (6 cures in 149 cases) in the operable and borderline cases and 19.0 per cent (40 cures in 201 cases) in the inoperable cases. The results of operation were improved by careful selection of the patients for surgical treatment. In the period from 1912 to 1931 the operative mortality was 10.3 per cent whereas in the period from 1922 to 1931 it was only 3.4 per cent. The absolute incidence of cure was 20.1 per cent.

The figures show that when on the basis of careful selection patients with easily operable carcinoma of the uterus are treated by operation followed by irradiation and the others are treated by irradiation a higher incidence of cure is obtained than by operation or irradiation alone.

In the period from 1912 to 1915 10 patients and in the period from 1915 to 1926 63 patients with cancer of the fundus of the uterus were admitted to the Clinic. Of the first group 80 per cent and of the second group, 93 per cent were operable. The incidence of cure in the 2 groups was 50 and 63 per cent respectively. The treatment of choice was surgical removal. In 30 cases total extirpation was done by the abdominal route and in 15 by the vaginal route. There were 2 deaths. In 28 cases postoperative irradiation was given, but without apparent improvement of the results. The author advises against treating operable carcinoma of the fundus with irradiation alone.

In the period from 1915 to 1926 there were 41 cases of recurrence. In 31 the recurrence appeared after primary cancer of the cervix. In 2 after cancer of the fundus and in 2 after cancer of the vagina. In 33 cases of recurrence of uterine cancer 3 cures were obtained by radium and X ray treatment.

WILLE (G)

EXTERNAL GENITALIA

Schulz, K.: A Clinical and Statistical Study of Carcinoma of the Vulva (Zur Kasuistik und Statistik des Vulvacarcinoma) *Zentralbl. f. Gynäkol.*, 1932 p. 2364.

The author describes an unusual large carcinoma of the vulva which had been noted by the patient from six to seven years previously, but was not recog-

nized as carcinoma by the physician consulted at that time. Following the report of this case he gives statistics on carcinomata of the vulva observed during the past twelve years at the University Gynecological Clinic at Jena. There were forty three cases, the frequency being 11 per cent. The ratio of carcinoma of the uterus to carcinoma of the vulva was 100:4.5. Carcinoma of the vulva was most common between the sixth and seventh decades of life, but one-fourth of the women were between forty and fifty years old and the youngest patient was thirty three years old. The most common site of the lesion was the labium majus, the next most common, the labium minus and the least common, the clitoris. In one instance Bartholin's gland was affected, and in another the posterior commissure. In 50 per cent of the cases involvement of the lymph glands could be demonstrated. Histological examination disclosed squamous-cell epithelioma in every case. Carcinooids were found in thirteen cases. In three cases the condition was inoperable. In only one case were the lymph glands on both sides removed with the carcinoma. In the other cases the operation was limited to removal of the carcinoma as far as healthy tissue.

Of the ten women who were operated upon, four died of recurrence and two of intercurrent diseases. The rest are still living after periods of from five to ten years. Two have remained free from evidence of the carcinoma for from six to seven years. The result in one case is remarkable as the woman is still alive ten years after the first appearance of the vulvar carcinoma, in spite of the fact that she has been operated upon twice for recurrence. Of the twenty-three women with carcinoma of the vulva who were treated and have since been under observation for more than five years, three have remained well. The incidence of cure was therefore 13.04 per cent. E. PHILIPP (G)

Gebornum, E.: Primary Sarcoma of the Vagina and Its Treatment (Das primäre Scheidenmarkom und seine Behandlung) 935 Munich, Dissertation.

The author differentiates two forms of sarcoma of the vagina, the nodular and the infiltrating. The nodes vary in size between that of a walnut and that of a fist. Only a few of them are covered by smooth mucous membrane. As a rule, the surface shows ulcerating degeneration and bleeding. The tumors are either broad based or pedunculated, and are generally adherent to the underlying structures. In consistency they are sometimes firm and sometimes soft and elastic. On section, they are usually found to be white, homogeneous, and marrow-like. The infiltrating type is considerably less common than the nodular type. Microscopically the most common are the spindle-cell sarcomata. Next most common are the melanosarcomata and the angio-plastic forms. Metastases are generally rare. The growth is essentially continuous, spreading to the rectum, uterus, and pelvic connective tissue. As a

rule the prognosis is equally unfavorable after operation and after irradiation.

A case in which a tumor the size of a pigeon's egg was found in the anterior wall of the vagina is reported from the Gynecological Clinic at Munich. The tumor was movable, slightly nodular, and isolated. A biopsy specimen removed with a diathermy electrode showed it to be a round-cell sarcoma. Irradiation of the hypophysis was first given as supporting and sensitizing therapy as is usually done at the Doederlein Clinic. The tumor was irradiated abdominocranially and treated also with mesothorium. Five months later the body weight had increased somewhat, but a dense infiltration extending up to the pelvic wall was found. A. SALOMON (X).

MISCELLANEOUS

Falkiner, N. McI.: A Study of the Structure and Vascular Conditions of the Human Corpus Luteum in the Menstrual Cycle and in Pregnancy *Irish J. M. Sc.* 1933 No. 85 p. 1.

The changes that characterize the endometrium during pregnancy and the menstrual cycle have been extensively studied and are well understood. However the differences between the corpus luteum of menstruation and pregnancy have not been very definitely described. A comparison of the corpus luteum of menstruation during its degenerative stage, namely just before and during menstruation, with the corpus luteum of very early pregnancy is logical as both are structures of the same age undergoing very different changes. Conflicting statements concerning the histology of the corpus luteum from its formation to its degeneration in the menstrual cycle are quoted by Falkiner from outstanding text books on obstetrics and gynecology. Hartmann has contended that an active substance originating out side of the ovaries is the cause of the periodical bleeding which we call menstruation, and concludes from experimental evidence that this substance originates from the anterior lobe of the pituitary gland. It would seem that coincident hemorrhage in both the endometrium and the corpus luteum might occur as in each structure there are newly formed blood vessels of a capillary nature and if a substance produces hemorrhage in one it is likely to do so in the other. To obtain evidence bearing upon this particular aspect of the sexual cycle in the human female, the author studied corpora lutea in the various phases of the menstrual cycle and in cases of pregnancy which were resected with the utmost care to avoid trauma to the delicate structures. The material furnishing the basis of his report consisted of corpora lutea removed on the fourteenth, twenty fifth, twenty-seventh, first, and third days of the cycle from two cases in which pregnancy terminated five days and fifty-six days respectively after the first missed period. The clinical history and microscopic picture of the tissues are reported in detail and the vascular conditions of the corpus luteum are shown by diagrams.

In its highest form of development the corpus luteum is essentially a mammalian structure, but it is particularly well developed in the monotremes which differ from the mammals in being oviparous. There is no doubt that it has a very great influence during the early stage of pregnancy, particularly in the embedding and the subsequent nutrition of the ovum. However, after the embedding has been completed its influence on the subsequent course of the pregnancy differs in different species of mammalia. Placentation differs tremendously in mammalia, and it seems reasonable to conclude that the structures and life history of the corpus luteum bear some relationship to placentation. As placentation increases in complexity in the mammalian scale the tendency to abort when the corpus luteum is removed decreases.

From his studies the author concludes that in mammals in which there is a placenta haemochorialis (chorionic epithelium invades the maternal vessels) the most important factor to be considered in the uterus and corpus luteum is the vascular arrangement. Haemorrhage occurs in the corpus luteum at two stages in the menstrual cycle. The first bleeding takes place at the time of ovulation. It is variable in amount and by many its occurrence is doubted. This haemorrhage is traumatic and localized. The second haemorrhage occurs at about the time of the onset of the menstrual flow and is generalized throughout the terminal capillaries which border the corpus tissue dividing the luteal cells from the central cavity. When haemorrhage occurs in the corpus luteum it marks the end of the career of the corpus luteum as a gland of internal secretion as the resulting disturbance in the circulation precludes the possibility of an uninterrupted circulation through the structure which of course, would be necessary for transference of the internal secretion. When pregnancy supervenes, no haemorrhage occurs and the corpus luteum persists as an active organ of internal secretion. The

period to which this activity is prolonged in the human female is doubtful. The author believes that the number of cells in the corpus luteum cannot be increased and that secretion is prolonged until the individual cells become senile there being then a gradual withdrawal of the secretion which probably ceases to be important as early as the second month of pregnancy. Recognition of contemporaneous haemorrhage in the uterine mucosa and the corpus luteum will lend support to Hartmann's work which has already done much to explain the menstrual cycle in primates. ALICE F. MAXWELL, M.D.

Werner A. A., and Collier W. D.: The Effect of Theelin Injections on the Castrated Woman. *J. Am. M. Ass.*, 1933, c, 633.

The authors report the use of large doses of theelin in the cases of five castrated women. In four of the women the uterus was still in place. The dosages were divided into three periods of twenty-eight days each. Two hundred rat units were administered daily in the first period, 300 in the second and 400 in the third.

In all of the patients a beginning activity of the breasts was noted from the fourth to the tenth day after the institution of the treatment. In all of the patients except the one who had been subjected to hysterectomy bleeding occurred at intervals during the course of injections. The periods of bleeding varied in number from two to four and were characterized by the symptoms usually associated with menstruation. In the hysterectomized patient the cervix became more vascular and there was a mucous discharge. After three weeks of treatment curettage showed an endometrium closely resembling that of the interval phase.

All of the patients treated were relieved of their subjective symptoms from six to twenty days after the beginning of the treatment.

HENRY S. ACKER, JR., M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Gemmell, A. A. and Murray, H. L.: Two Cases of Simultaneous Intra-Uterine and Extra Uterine Pregnancy, with a Review of the Recorded Cases. *J. Obst. & Gynec. Brit. Emp.* 1933 31, 67

Following a review of 213 cases of simultaneous intra-uterine and extra uterine pregnancy collected from the literature, the authors report 2 cases in which enlargement of the uterus was associated with a fairly definite picture of extra-uterine pregnancy. In the first of their cases laparotomy disclosed a fetus between twelve and fourteen weeks of age and when the uterus was incised a twelve weeks fetus was found.

In the second case, the left tube contained the extra-uterine fetus and was enlarged to the size of a sausage. This tube was removed, but the fundus of the uterus, which was blue and enlarged to the size of a twelve weeks pregnancy was not disturbed. The patient went on to term and was delivered normally.

Some of the cases reported in the literature as cases of simultaneous intra-uterine and extra-uterine pregnancy were in reality cases of twin pregnancy in a fallopian tube or of pregnancy in both horns of a bicornate uterus.

The mortality of simultaneous intra-uterine and extra-uterine pregnancy is 30.7 per cent. The condition is most frequent between the ages of twenty five and thirty five years. Statistics indicate that its occurrence is favored by previous pregnancies and labors.

The cases reported in the literature are divided by the authors into the following 4 groups.

Group 1. Sixteen cases in which the condition was first discovered after death. Apparently no special surgical care was given. All but 1 case were recorded prior to 1897.

Group 2. Forty-one cases in which the condition was discovered after labor. In this group there were 6 deaths, a mortality of 14.6 per cent. Half of the patients had no symptoms before or after delivery. This group shows that the extra uterine fetus may be removed safely after delivery of the uterine fetus.

Group 3. Twenty cases in which the condition was discovered in the second half of pregnancy or during labor. There were 7 deaths, a mortality of 35 per cent.

Group 4. One hundred and forty cases in which the condition was discovered in the first half of pregnancy. In 47 it was discovered after and in ninety three before abortion of the uterine ovum. In the former there were 7 deaths, a mortality of 15 per cent. Most of the deaths were caused by

shock or hemorrhage, but 1 was due to sepsis. Abdominal section was performed in 39 cases with 5 deaths, a mortality of 13 per cent. In the 93 cases in which the condition was discovered before abortion of the uterine ovum there were 9 deaths, a mortality of 9.7 per cent.

The authors attempted to ascertain the factors which determine whether the uterine pregnancy will continue or will be cast off. From their findings they conclude that there are no definite criteria on which to base a prognosis of the fate of the intra-uterine ovum.

Their studies showed also that a fetus retained in the abdominal cavity is not prone to give rise to symptoms, even when it is associated with an intra-uterine pregnancy and that it is not likely to cause difficulty in labor. M. C. ENGLISH, M.D.

Lapeyre J. L.: Interstitial Pregnancy (Grosses Interstitielle) *Gyna. u. Obst.*, 1933 xxvi, 481

Interstitial pregnancy occurs more frequently than is commonly supposed and presents many diagnostic and therapeutic problems. The author cites the numerous theories advanced to explain the pathogenesis of the condition. None of them adequately explains all cases.

The chief histological characteristics of interstitial pregnancy are the absence of a true decidua, the presence of masses of fibrin, and penetration and distant invasion of the uterine musculature by the placental villi.

The prognosis is variable. Most often the ovum ruptures into the abdominal cavity occasionally into the uterine cavity and in a few cases into the broad ligament. A very young ovum may die and become absorbed but after the death of a fetus the syncytium may continue to invade the maternal organ. Following rupture, prompt surgical intervention is necessary to prevent death from internal hemorrhage.

The diagnosis of interstitial pregnancy is seldom made before rupture or surgical intervention. In the differential diagnosis, isthmic pregnancy, tubal pregnancy and pregnancy in a uterus in lateral flexion must be considered. Pregnancy in a uterus in lateral flexion can be differentiated by examining the patient in the Trendelenburg position. Tubal pregnancies are situated below the level of the uterine fundus and occupy the posterior cul-de-sac. The presence of a soft tumor at one side of the fundus and in a plane above and anterior to the fundus indicates either an interstitial pregnancy or a pregnancy situated in the uterus at an angle. As an interstitial pregnancy is covered by few muscle fibers, palpation of the mass will not elicit the alternate contraction and relaxation which oc-

LABOR AND ITS COMPLICATIONS

Rudolph, L., and Ivy, A. C.: Internal Rotation of the Fetal Head from the Viewpoint of Comparative Obstetrics. *Am J Obst. & Gynec.* 1933, xiv, 74.

The basic factor determining the presentation and position of the fetus is the postural tone of the uterine musculature. The attitude of the head in the presence of normal cephalopelvic relations is due to the integration of three factors, namely, a harmoniously contracting uterus, the resistance to egress, and the unequally balanced two-armed lever that exists between the vertebral column and the head. If the force transmitted through the fetal spinal column is misdirected by improper coordination of the upper uterine segment or if the lower uterine segment or cervix is more atonic or yielding in one portion than another the lever action will be modified or abnormal. By rotating the fetal back anteriorly the uterus assumes anterior rotation of the occiput. With the occiput right or left anterior the levatores ani, the decreased resistance of the vulval slit, and the larger anteroposterior diameter of the outlet may rotate the occiput anteriorly. With the occiput in a transverse or a posterior position, the head well flexed, and the uterus coordinating and contracting adequately the vertex is deflected anteriorly in a sagittal plane on striking the pelvic floor and a two-armed lever action operates in a vertical plane to rotate the forehead posteriorly and the occiput anteriorly about the vertex or occipito-atloid articulation as an axis.

A mechanism for typical and atypical delivery of the shoulders in occiput-posterior positions is described.

A brief description of the comparative anatomy of the pelvis and the comparative physiology of the uterus in labor is given, and the results of a recent genographic study of the delivery of the fetus in the dog are reported. On the basis of their studies the authors conclude that in lower animals the uterus is primarily responsible for placing the fetus in a dorso-sacral position for physiological birth.

In conclusion the authors cite certain observations made in the cases of human females which may be interpreted as indicating that the uterus rotates the trunk and head. Whether this is due to the existence of a uterine property of "spiral action" cannot be stated on the basis of the evidence at hand.

EDWARD L. CORRELL, M.D.

Greenhill, J. P.: Local Infiltration Anesthesia in Obstetrics. *Swed. M. J.*, 1933, xiv, 37.

Three types of anesthesia may now be used by the obstetrician — Inhalation anesthesia, spinal anesthesia, and local infiltration anesthesia. Inhalation anesthesia, the oldest, has always had certain definite disadvantages. The mortality from the anesthetic agent, while low, is not negligible. Pulmonary complications are frequent, and the toxic

effects of the anesthetic mixture on vital organs must be considered. Acidosis, alkalosis, shock, and dehydration may complicate the puerperium.

Spinal anesthesia, a more recent development, has a definite mortality which, according to Konrad, amounts to 1 fatality in 2,610 cases. Because of inhibition of the respiratory movements, pulmonary complications are at least as frequent as after inhalation anesthesia. The toxic effects of the anesthetic drug on the nervous system are manifested by paralysis of the oculomotor and abducens nerves, headaches, and the later development of spastic paralysis and paraplegia. Subarachnoid anesthesia has always been contra-indicated in the anemias and cardiopathies. Pregnant women are especially susceptible to abnormal reactions to drugs such as those used to induce spinal anesthesia. Moreover, the induction of spinal anesthesia is rendered difficult in pregnancy as the back cannot be bent properly.

Local infiltration anesthesia, which is relatively new, can be employed for every procedure practiced in obstetrics. The only contra indications are the cases of nervous women and cases in which the site of injection is involved by infection or inflammation.

The author has used local infiltration anesthesia for dilatation and curettage, spontaneous delivery, episiotomy, the repair of both recent and old lacerations, low forceps delivery, cesarean section of the low classical and Poirry types, anterior vaginal hysterotomy and abdominal and vaginal sterilization.

Fifteen minutes prior to the operation a hypodermic injection of $\frac{1}{4}$ gr. of morphine and $\frac{1}{200}$ gr. of atropamine is given. The patient is made comfortable on the table with pillows, the knees are tied down gently and the arms are placed in a loose sling. A trained anesthetist or nurse stands at the head of the table to reassure the patient, and the operator speaks to the patient occasionally unless she becomes drowsy. Absolute quiet must prevail. The anesthetic agent is a $\frac{1}{2}$ or $\frac{3}{4}$ per cent solution of procain hydrochloride (novocain) containing 2 drops of a 1:1,000 solution of epinephrin to each ounce. For minor procedures only 4 oz. of the solution are used, whereas for cesarean section from 6 to 8 oz. may be necessary.

For dilatation and curettage the parametrium is injected. The introduction of pituitary extract directly into the uterus limits bleeding to the minimum.

For spontaneous delivery the infiltration is made midway down one labium majus and the edge is infiltrated down and across the fourchette to a similar point on the other side. The layer between the vagina and rectum is then infiltrated for a distance of about 6 cm. with about 30 c.c.m. of the solution. Next, the levator fascia and the muscle bundle are infiltrated, about 10 c.c.m. being injected into each side. Within a few minutes the outlet is relaxed and gaping. The pains may cease for a few minutes, and occasionally a 2-unit injection of

pituitrin is necessary. Low forceps may be applied without pain.

For episiotomy, the line of incision is further infiltrated and 10 c.cm. of the solution are injected into each ischioanal fossa for a distance of about 5 cm. This area is found midway between the anus and ischial tuberosity. As pain is absent, the patient will not be afraid to bear down.

For vaginal hysterotomy the parametrial block is supplemented by an injection of 5 c.cm. between the bladder and uterus. For wide retraction in filtration of the vulva is necessary.

Cesarean section requires infiltration of the abdominal wall only. The infiltration should extend 3 cm. on each side of the incision, and at the pubic arch, which is especially sensitive, it should be more extensive. Sufficient time must be allowed for the anesthetic to act before the cesarean section is begun. In the low cervical operation the use of about 45 c.cm. of the solution will aid in the separation of the peritoneum from the lower segment.

The technique of the induction of anesthesia for the Porro cesarean section and for sterilization is also described in detail.

In 68 per cent of 150 cesarean sections Greenhill used local anesthesia alone and in 8 per cent he used ethylene in addition. There were no maternal deaths.

DONALD G. TOLLESON M.D.

Roques, F: Anesthesia for Eutocia. *Lancet* 1933
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At the present time the pain of childbirth is alleviated by one of two methods—a procedure to shorten the labor or the administration of a drug. The routine use of any one method or drug is dangerous. Each patient should be treated according to her individual reaction to labor pain.

The author reviews all of the accepted methods of producing analgesia in labor and gives the advantages and disadvantages of each. He divides the drugs into the sedatives, the anesthetics, and the hypnotics.

The four most commonly used sedative drugs are potassium bromide, chloral hydrate, morphine, and hyoscine. These are employed most frequently during the first stage of labor when there is a disturbance of uterine action due to anomalies of the forces or a delay due to mechanical causes. As an example of the type of case in which a sedative drug is indicated Roques cites the case with a minor degree of pelvic contraction, occiput posterior presentation, early rupture of the membranes, sluggish action of the uterus, and slow dilatation of the cervix. A mixture of from 15 to 20 gr. each of potassium bromide and chloral hydrate is safe. However, when this is given without an opiate it is often ineffective.

The most useful of all drugs for the induction of analgesia is morphine. According to Faibalm, this should be given when the patient is tiring and before she is tired. Roques states that it should be given when a long labor is anticipated when the patient is unduly nervous, hypersensitive, fearful or neurotic

and when a usually high-strung patient is rapidly tired by short ineffective contractions. The first dose should be from $\frac{1}{6}$ to $\frac{1}{2}$ gr. Roques believes that a second dose is rarely necessary. He cautions against the use of morphine when delivery is expected before three hours. Morphine is of great value in eclampsia. A mixture of morphine and hyoscine is considered by Roques to be impractical except under ideal circumstances as it prolongs labor and causes restlessness and excitement.

Of the anesthetic drugs, Roques discusses chloroform, ether, and nitrous oxide and oxygen. He believes that in the average case chloroform is of much more value than ether as it acts more quickly, it causes less severe vomiting and the analgesia it induces can be more rapidly converted into anesthesia. Moreover, ether causes excessive mucus in the air passages. From 2 to 4 dr. of chloroform are usually sufficient. More than 6 dr. should never be used. If anesthesia for operative delivery is desired, ether or chloroform and ether may be used.

Ether may be employed by the same methods as those used for the administration of chloroform. Roques describes the Gwathmey method, but states that in his limited experience with it he has not found it practical.

Nitrous oxide and oxygen is the ideal anesthetic when prolonged analgesia is desired and the environment and personnel necessary for its administration are available. Its disadvantages are its cost and the cumbersome apparatus required for its administration.

Of the hypnotic drugs, Roques discusses avertin, sodium amylal, pemocton and nembutal. He considers nembutal the best and sodium amylal the least satisfactory. However, he states that he has never used sodium amylal. Disadvantages common to all of the hypnotic drugs are that they produce excitement and prolong labor; there is no method of gauging the proper dosage and the correct treatment of overdosage is not known.

Roques concludes that in the ordinary case the use of morphine in the first stage and of chloroform toward the end of the second stage is the most satisfactory procedure, but when the patient is able to afford it and when she is delivered in a hospital the use of morphine in the first stage and of nitrous oxide and oxygen supplemented by ether toward the end of the second stage is the method of choice.

CHESTER C. DOHERTY M.D.

PUERPERIUM AND ITS COMPLICATIONS

Liebmann, I: *Illeus in the Puerperium* (*Illeus im Wochenbett*). *Orvosi kelt.*, 1932 p. 790.

During the puerperium the attention of the obstetrician is directed primarily to the condition of the genital organs. For this reason the timely recognition of extragenital abdominal disease is very difficult. *Illeus* during the puerperium is very rare and has an unfavorable prognosis because of the late diagnosis. The author reports two cases.

The first case was that of a para-I, twenty nine years old, who was admitted to the hospital for delivery at the end of pregnancy. Four years previously she had had a strangulation ileus following an anterior fixation (Doléris) and a salpingo-oophorectomy on the right side. After operative division of the adhesions the intestinal function returned to normal. Several days before she entered the hospital for delivery she had pains in the lower part of the abdomen which the midwife believed were weak labor pains. Artificial rupture of the bag of waters was done and spontaneous delivery occurred without complications. On the first day of the puerperium peritoneal symptoms, meteorism, vomiting, and hiccups developed. As laxatives had no effect and the condition rapidly became worse laparotomy was performed. The abdominal cavity contained a bloody serous exudate and the loops of the small intestine were blue and enlarged to the size of an arm. A loop of ileum 20 cm. long was found to be strangulated by an adhesion extending from the right tubal angle to the wall of the pelvis. The gangrenous loop of bowel was resected and entero-enterostomy was performed. Death occurred soon after the operation.

The second case was that of a twenty year-old para I who left the clinic on the ninth day after spontaneous delivery and an uneventful puerperium and was re-admitted five weeks later. After her discharge from the hospital she had been well for a brief interval, but then began to suffer from cramps in the lower part of the abdomen, which were aggravated by defecation. The abdomen was distended and was painful to pressure. Vomiting occurred. Roentgen examination revealed stenosis in the lower part of the ileum. Laparotomy was performed because high enemas could not overcome the obstruction. Both adnexa showed signs of recent inflammation. On the right side there were loops of adherent ileum strangulated by a circular band. The strangulating band was resected and entero-enterostomy was performed. Healing occurred by second ary intention.

In spite of the infrequency of intestinal obstruction in the puerperium the possibility of its occurrence should always be considered and operation should be performed immediately after the onset of such symptoms. If operation is done in time and there is no delay because of the use of cathartics, the incidence of cure will be considerably increased.

E. GOLDENBERG (G)

NEWBORN

Dunham, E. C.: Septicemia in the Newborn.
Am. J. Dis Child 1933 xiv 220.

The author reviews the literature on septicemia in the newborn and reports on thirty nine cases collected over a period of five years. In these cases positive blood cultures were obtained during the illness or shortly after death. The predominant organisms were streptococci, staphylococci, and

colon bacilli. Pneumococci and the bacillus pyocyaneus were also cultured. Thirty-four of the thirty-nine infants died. In the cases of streptococcus infection the mortality was 100 per cent, whereas in those of staphylococcus infection it was 73 per cent.

The sepsis was generally accompanied by fever enlargement of the spleen, jaundice (except in the cases of streptococcus infection) bleeding a leucocytosis, and anemia. The white blood-cell count ranged from a leucopenia of 4,000 to a leucocytosis of 50,000. All of the infants with a leucopenia died.

In eight cases the infection was of hematogenous origin. In seven, the membranes ruptured prematurely causing staphylococcus septicemia in five, streptococcus septicemia in one, and colon bacillus septicemia in one. Umbilical infection was present in seven cases. Cutaneous infection occurred in fifteen. In eight of the latter the lesion was erysipelas. In two of the infants the infection followed circumcision. Three infants had infected lesions of the mouth, seven had diarrhea, and three had suppurative otitis media. In six cases the source of the infection could not be determined.

All of the infants were less than one month old when the illness began. In eight cases the symptoms were present at birth. In four they appeared during the first day of life in nine during the first week and in eight, after the second week. Thirty of the thirty nine infants were boys.

The author believes that septicemia is a relatively frequent cause of morbidity and mortality of the newborn, and recommends that blood cultures be made when an infant becomes ill and the diagnosis is obscure. He states that if the cause of the illness is determined early and transfusions of blood and other treatments are given, recovery may result.

HARRY M. NELSON M.D.

MISCELLANEOUS

Borris, P. E.: The Aschheim Zondek Reaction in Chorionepithelioma (El corioepitelioma y la reacción de Aschheim-Zondek) *Semana med* 1932 xlvii, 670.

The Aschheim Zondek reaction is of aid in the recognition of pathological pregnancy as well as normal pregnancy and in the differential diagnosis between pregnancy and other conditions of the genital tract.

The value of this test in the diagnosis of hydatidiform mole and chorionepithelioma was first recognized by Aschheim who obtained a positive reaction in a case of metastasis of chorionepithelioma to the kidney eighteen months after hysterectomy. Aschheim's series of cases has since increased to twenty. In certain cases of hydatidiform mole in which the reaction remained positive for a few weeks after expulsion of the mole curettage was indicated for the removal of retained parts or the beginning of a chorionepithelioma. On the other

hand, in one of Aschheim's cases a diagnosis of chorionepithelioma was made on the basis of curettings when the Aschheim Zondek reaction was negative. Although the patient refused operation, she recovered and is now entirely well, a fact proving that the microscopic diagnosis was erroneous.

In determinations of the amount of the hormone of the anterior lobe of the hypophysis in the urine in cases of hydatidiform mole and chorionepithelioma, Zondek found that the quantity is greater than in normal pregnancy. While in normal pregnancy each liter of urine contains from 20,000 to 30,000 units, in hydatidiform mole and chorionepithelioma it may contain from 40,000 to 2,000,000 units. These quantitative observations are therefore of value in the diagnosis of pathological changes of chorionic elements, 50,000 units or more per liter of urine indicating neoplastic degeneration.

Rosler made similar studies of the urine in 7 cases of hydatidiform mole, 3 cases of hydatidiform mole and probable chorionepithelioma, and 3 cases of chorionepithelioma. In all, the amount of hormone of the anterior lobe of the hypophysis was much greater than in normal pregnancy.

Of the 2 cases of chorionepithelioma reported by the author, 1 was that of a girl nineteen years of age who had been married seven months. According to the history menstruation had always been normal in all respects. At about the beginning of the third month of pregnancy a uterine hemorrhage occurred. This was accompanied by a slight elevation of the temperature, intermittent pelvic pain, nausea, and vomiting. During a period of two weeks of conservative treatment in bed, the symptoms became aggravated and a hydatidiform mole was passed. After curettage the hemorrhage ceased. During the next ten days there was general improve-

ment, but at the end of that time the hemorrhage recurred. The Aschheim Zondek test made thirty three days after the curettage was strongly positive. Supravaginal hysterectomy including both tubes was therefore performed. Pathological examination showed the uterus to be about twice the normal size and of a softer consistency than normal. The peritoneal surfaces had their normal luster. In the uterine cavity there was a flat mass projecting from the fundus and posterior wall almost the length of the corpus uteri. It was about 1 cm. thick and dark red. A histopathological diagnosis of chorionepithelioma was made from this tissue.

In the other case reported by the author the symptoms, signs, and clinical course indicated neoplastic degeneration of chorionic elements. On the date when normal menstruation should have appeared the patient had a profuse uterine hemorrhage and passed numerous clots, among which products of conception were recognized. After eight days in bed she began to complain of pain in the lower part of the abdomen, especially on the right side. The bloody discharge recurred with numerous clots. Following curettage the hemorrhage ceased. A few days later the patient complained of chilliness and perspiration, and a slight bloody vaginal discharge occurred. There was no fever. Copious hemorrhage again appeared and curettage was done again. There after clots were passed almost daily. On pelvic examination the uterus was found to be somewhat enlarged, softer than normal, and painful on manipulation. Before operation was advised the Aschheim Zondek test was carried out. The result was negative. Accordingly conservative treatment with ice packs, ergot and sedatives was continued. The hemorrhage finally ceased and since then the patient has been well. WILLIAM R. MEYER, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Gérard, M.: Aneurisms of the Renal Arteries (Les anévrismes des artères rénales). *J. d'uról. méé. et chir.* 1932, xxiv 353-440.

This article is based on forty nine cases of aneurism of the renal arteries collected from the literature.

Gérard maintains that there is only one kind of aneurism of the renal arteries—the true aneurism. So-called false aneurisms, he believes, are only complications of kidney injuries.

The triad of symptoms—pain, hematuria, and perirenal swelling—given in the classical textbooks was based on examinations of false aneurisms. Of the forty nine cases of true aneurism reviewed by the author this triad was present in only five.

Aneurisms of the renal arteries are about equally frequent in men and women, and may develop on either the right or the left side. They are almost always unilateral and solitary. As a rule they are outside the renal parenchyma, within or immediately adjacent to the hilus and generally are intimately connected with the pelvis.

Ruptured and unruptured aneurisms are considered separately as they are quite different. Unruptured aneurisms generally occur in old persons and are caused chiefly by arteriosclerosis. They develop slowly and show a marked tendency toward calcification. The prognosis is good as they do not rupture. Ruptured aneurisms of the renal arteries are found chiefly in young persons and are produced by the usual causes of aneurism in other locations. They develop gradually. The prognosis is very unfavorable. These aneurisms are twice as frequent as the unruptured aneurisms occurring in old persons.

Calcified aneurisms in old persons cause pain in the region of the affected kidney with ordinary urinary symptoms. Roentgen-ray examination will reveal an annular shadow, and pyelography will show it to be located at the hilus, but outside of the pelvis. An exact diagnosis of calcified aneurisms is therefore possible. Aneurisms of the renal arteries in young persons produce practically no symptoms until they rupture. After rupture the following three distinct clinical forms may be distinguished:

1. The pure hamaturic form. This is found in one-third of the cases. Its development is quite slow requiring several weeks or months. The prognosis is unfavorable. A diagnosis may be made by the usual urological methods, but the condition is so rare that it is often not considered. Arteriography will help in the diagnosis.

2. The form with perirenal swelling. This form is found in about half of the cases. It generally develops suddenly with a large accumulation of peri-

renal blood, pain, and signs of pressure and internal hemorrhage. The development of the swelling is so rapid and the patient a condition is so serious that it is rarely possible to do more than make a diagnosis of perirenal hematoma.

3. The mixed form with hematuria, perirenal tumor and pain. This is rare. It is the only form that corresponds to the classical description and the only one in which the few diagnoses reported have been made. The prognosis is very unfavorable.

Following the rupture of a renal aneurism operation is always indicated. In the pure hamaturic form of ruptured aneurism time may be taken for urological examinations to determine kidney function. In the form with perirenal tumor and in the mixed form, operation is generally urgent, but, if possible time should be taken for a determination of renal function. Operation is generally indicated in cases of unruptured aneurism on account of the danger of rupture. It is contra-indicated when the patient is old and has generalized arteriosclerosis. In some cases, simple removal of the aneurismal sac will be sufficient, but as a rule nephrectomy is necessary. The kidney pedicle should be clamped to prevent hemorrhage in case the sac of the aneurism ruptures.

AUMARY GOSW M.D.

Motz, C.: Suppurative Nephritis (Les pyonéphrites). *Arch. uról. de la dis. de Vester* 1932 vii, 231.

This is an article of 200 pages limited to a discussion of localized suppurations of the renal parenchyma.

The lesions under consideration have been described by the following 3 names, none of which is entirely satisfactory: "carbuncle of the kidney," "surgical nephritis," and "suppurative nephritis." The author prefers the name "pyonephritis" as the dominant characteristic of the condition is localized suppuration.

Miliary abscesses of the kidney were first described by Rayer in 1841. Later Hallé Albarran, Achard, and Lannelongue (1887-89) studied their pathogenesis experimentally. The first localized abscess was reported by Israel in 1901 as a carbuncle of the kidney. In France, interest in cortical abscesses dates from the publications of Chevaux in 1912. Since that time reports regarding them have become increasingly numerous.

In 1919 Bergeret came to the conclusion that all pyonephritic abscesses have their origin in cortical abscesses of the kidney.

Pyonephritis occurs at all ages, but is most frequent between the twentieth and fortieth years. Its incidence is the same in males and females. The lesions occur twice as frequently in the right kidney as in the left kidney. They are bilateral in 4 per cent

of cases and under such circumstances are usually a part of a fatal pyemia. Trauma is of little importance in their causation.

The most important single source of the infection is a furuncle due to the staphylococcus. In the large variety of other primary foci of infection which have been found the type of organism is variable.

The hematogenous mode of infection has been recognized since the experiments of Hallé and Albarran. The ascending route may be taken by the infection, but usually only under special conditions such as obstruction of the urinary passages. The other kidney may be infected through the lymphatics. Sweet and Stewart maintain that ascending lymphatic infection can occur from the bladder independently of urinary retention.

From the standpoint of pathological anatomy 3 types of abscess can be distinguished—miliary abscesses, the large (usually single) abscess, and carbuncle of the kidney.

Miliary abscesses are usually multiple. They are located immediately beneath the capsule where they may be mistaken for tubercles. A commonly associated lesion is the septic red infarct. Involvement of the perirenal fat results in fibrosis, abscess, or phlegmon.

Large abscesses are usually single and seldom number more than 5. They may evacuate into the renal fossa or, less commonly, into the pelvis.

Carbuncle of the kidney differs from the solitary abscess in being a process of coagulation necrosis rather than suppuration.

When a cortical abscess is complicated by pyelonephritis the invading organism is usually the bacillus coli.

Cortical abscesses show a marked tendency to heal. The residual lesions consist of depressed areas of fibrosis.

Three clinical forms of suppurative nephritis are recognized, namely septicaemia carbuncle, and chronic pyelonephritis. In the first form the patient presents the signs and symptoms of a general infection. Local signs are absent or slow to appear. Eventually pain and tenderness develop in the lumbar region. As a rule a history of a previous focus of suppuration can be obtained. The initial septicaemia may be overwhelming or mild. In the latter event local symptoms appear early. Occasionally hematuria is an outstanding and confusing sign.

Carbuncle of the kidney is rare. Clinically it belongs with the subacute septicæmic forms. It is accompanied by local pain and enlargement of the kidney and sometimes by a pyelonephritic abscess. The functional capacity of the kidney is lowered. The septicæmic forms with miliary abscesses have no such effect.

A chronic exacerbating pyelonephritis may mask rather than reveal an underlying cortical abscess. This condition is rare. Stone, tuberculous, or pyonephrosis is usually suspected. Failure of a retention ureteral catheter to relieve the general symptoms is an important aid in the diagnosis.

Miliary cortical abscesses commonly occur in the terminal stages of urinary retention due to prostatic hypertrophy or urethral stricture. They are beyond the resources of surgery.

In cases of renal abscess, except those of the pyelonephritic form urinary symptoms are usually absent. The urine is normal or contains traces of albumin, casts, and microscopic blood. Bacteriuria is common and of importance from the standpoint of diagnosis. Examination of the blood reveals a leucocytosis.

Röntgenography is of little aid in the diagnosis. However when present, immobilization of the diaphragm on the affected side is of significance.

The most conservative treatment is decapsulation. This gives excellent results even when not all of the abscesses are immediately subcapsular. Occasionally secondary nephrectomy becomes necessary. In cases of large single abscesses, incision and drainage are indicated.

German surgeons prefer nephrotomy to decapsulation. The results of the 2 operations are much the same. Theoretically nephrotomy is associated with greater danger of hemorrhage, loss of function and infection and is followed by more prolonged convalescence.

Partial resection of the kidney has numerous disadvantages and dangers and is rejected by most surgeons.

Successful enucleation of a carbuncle has been reported by Neff.

Nephrectomy is generally considered the treatment of choice. It is attended by fewer dangers than the other procedures and is followed by recovery more quickly. However it can be done only if the condition of the other kidney is satisfactory.

Operation should be performed as soon as the diagnosis is made. There is nothing to be gained by waiting for the physical signs of suppuration, and in the hyperacute, septicæmic forms, a delay may be fatal.

The article is concluded by a review of 144 cases. It is supplemented by 7 illustrations and a bibliography of 85 references. ALBERT F. DE GROOT, M.D.

Talbot, A. Abscesses of the Renal Cortex (*Les abcès de la corticité du rein*) *Arch. de med. et reins et d. organes urinaires* 1933, vii, 11.

Hematogenous infections of the kidney are variably manifested. They may result in a simple bacteriuria or a pyelonephritis with an inflammatory reaction of varying intensity. Involvement of the perirenal fat may occur with the formation of a phlegmon or abscess. In some cases suppuration occurs in the parenchyma alone forming closed abscesses of the cortex which eventually extend to the excretory passages or more frequently to the perirenal tissue.

Miliary abscesses and gross renal suppuration as a part of a pyemia have been understood since Rayer's studies early in the nineteenth century. Frequently the lesions are bilateral and beyond the resources

of surgery. Knowledge of localized unilateral abscesses of the kidney dates only from the work of Lannelongue (1879), Albarran (1883) and Achard. In cases of abscesses of this type early diagnosis often permits a cure by conservative surgical measures. Cortical abscesses are the source of a large percentage of perinephritic abscesses and phlegmons and explain why the latter even when properly drained, continue to suppurate for long periods.

In some cases cortical abscesses are multiple and located just beneath the capsule. Their oval or irregular outline distinguishes them from tubercles. The overlying fat and capsule are almost constantly involved in the inflammation. Solitary abscesses lie deep in the parenchyma and may reach the size of a pigeon's egg or even that of an orange. They usually extend to the capsule. Sometimes the entire kidney is riddled with abscesses. Under such conditions the excretory passages are always involved.

Surgical abscesses of the kidney is quite rare. In 1931 Flischoff was able to collect only 176 cases. However such abscesses often escape recognition because they heal spontaneously or are obscured by a secondary perinephritic suppuration. In rare cases healing occurs by evacuation into the renal pelvis.

The cause of unilateral cortical or surgical abscesses of the kidney is an incipient septicaemia. The first to call attention to cutaneous lesions as the site of origin of the infection was Verneuil. According to Richardson, furunculosis is present in 51 per cent of the cases. Next in importance as causes are tonsillitis and appendicitis.

Localization in the kidney is favored by traumatic previous infection, calculi and congenital malformations or other conditions producing stasis.

While the infection is usually carried by way of the blood stream, it sometimes reaches the kidney through the lymphatics from the bladder genital tract, colon, or right leg.

Symptoms appear after a latent period during which the original lesion (furuncle) may heal. The interval is usually about fifteen days. The onset is characterized by chills and fever and often by vomiting and hiccup. There is marked prostration. Pain in the hypochondrium develops quickly. It is aggravated by deep breathing, and usually radiates toward the iliac region. The maximum point of tenderness is posterior at the junction of the twelfth rib and the erector spinae mass of muscles. Often there is a sensitive point above the iliac crest where the cutaneous branches of the twelfth nerve emerge. The condition causes contracture of the lumbar muscles and flexion of the thigh.

The roentgen signs consist of immobilization of the diaphragm on the affected side which obscures the psoas shadow or an increase in the size of the renal shadow. Intravenous urography sometimes reveals deformities of the calyces.

Polyuria is frequent. This is in contrast to the oliguria which usually accompanies high fever. The

urine is usually normal. Reduced functional capacity can be detected only by separate examination of the kidneys. The combined capacity is often normal.

The chemical composition of the blood is also normal, but a leucocytosis is always present. The leucocyte count may rise to from 15,000 to 35,000. The percentage of polymorphonuclear leucocytes is about 80.

Hemoculture gives inconstant results and is not indispensable.

In cases of single parenchymatous abscesses the symptoms are apt to be less violent and enlargement of the kidney is more easily detected.

Occasionally the symptoms are insignificant and the lesions heal spontaneously. Attacks may recur over long periods. In cases with recurrent attacks abscesses in all stages of formation and healing have been found. As a rule the infection extends to the perinephal fat. Rarely, it extends to the pelvis where it produces pyelonephritis. Such extension is peculiar to infections due to colon bacilli and other organisms of the same group.

The symptoms of chills aid in the diagnosis are general symptoms of infection with pain indicating a renal origin. In the presence of pyuria, pyelonephritis must be ruled out.

Medical treatment is rarely curative. It includes the general measures taken for fever and vaccine therapy. The object of surgical treatment is drainage. When the abscesses are small, multiple, and superficial, decapsulation is added. Deep collections are opened with the cateter. When the kidney is riddled with abscesses, nephrectomy is indicated. However there is danger that the lesions may be bilateral. Between these two conditions, there are many intermediate stages in which the indications are not clearly defined. Wide incision of the renal parenchyma is not recommended. Large septic infarcts of the kidney with perinephritic phlegmons demand nephrectomy. The state of the tissues is much like that of a carbuncle. Drainage is useless. Partial nephrectomy is dangerous and of questionable value.

ALBERT F. DE GROAT, M.D.

Mastromonte, G.: Resection and Autoplastic Grafting of the Solitary Kidney. An Experimental Study (Resezione ed innesto autoplastico del rene unico). *Ricerche sperimentali. Ann. del. di chir.* 1932, 21, 2276.

Resection of the kidney is seldom performed in preference to total nephrectomy as nephrectomy is more simple and can be performed more quickly. Removal of all of the diseased tissue by resection and hemostasis in resection are difficult, and it is difficult to diagnose the early circumscribed lesions for which resection might be most advantageous. However lesions such as benign tumors, cysts, traumatic lesions, and calculi adding in the solitary kidney may necessitate surgical intervention.

To determine the safety of resection the author carried out two series of experiments on sixteen dogs. Following unilateral nephrectomy resection

and autoplasmic grafting were performed on the remaining kidney in nine of the animals and simple resection and suture were done in seven. In the first group about one-eighth, and in the second group, one-third of the kidney was resected. After the operation the dogs were kept on a mixed diet and studies of the function of the kidney were made.

From the results the author concludes that a graft of kidney onto kidney gives complete assurance of hemostasis and is always well tolerated produces benign and gradual regression and substitution, beneficially stimulates the kidney and causes no marked or dangerous change in renal function.

ERGENS T LEROY M D

Calef C. Histological and Functional Changes in the Remaining Kidney Following Unilateral Nephrectomy (Modificazioni istologiche e funzionali del rene superstite dopo nefrectomia unilaterale) *Arch ital di urol.*, 1932 ix, 375 637 670.

The author reviews the literature and discusses the various theories regarding compensatory hypertrophy. He then presents a detailed description of his experiments on eight dogs over a period of from three to one hundred and ninety days following unilateral nephrectomy. In addition he reports thirteen clinical cases which he divides into three groups according to the degree of function of the kidney removed.

In the experiments on dogs there was more or less oliguria for several days after the nephrectomy with a return to normal within four or five days. The excretion of urea was variable but always greater than before the operation. It returned to normal in from one day to one or more weeks. The excretion of nitrogen, ammonia, and amino acids paralleled the excretion of urea, but the increase lasted much longer. The elimination of chlorides was increased only during the first day. In no instance did the urine contain any pathological elements such as albumin, pus, and casts.

The blood chlorides and nitrogen were increased after the operation, but the increase in the nitrogen persisted much longer than the increase in the chlorides. During the first thirty two days the weight of the remaining kidney was increased from 8 to 27 per cent. It then gradually decreased toward the normal.

During the first few days histological examination revealed only edema, vasodilatation, and some infiltration. The most important changes were turgidity of the epithelium of the convoluted tubules, scarcity of karyokinetic figures, and ruptured cells in many places. No tendency toward neoformation of glomeruli or tubules was observed. The histological changes were transitory lasting only about seven days.

In the clinical cases the nephrectomy was followed by oliguria for the first day. There was then a gradual increase in the quantity of urine to polyuria, which lasted for seven or eight days depending upon the degree of function of the extirpated kidney.

The urea excretion was increased for several days. In all three groups of cases the chloride excretion was decreased but returned to normal when a normal diet was given. The excretion of ammonia and amino acids showed a quick increase which persisted longer than the increase in the excretion of urea. The urine was free from pathological elements. The author believes that alimentation is a factor in the findings.

From histological studies he concludes that a moderate hypertrophy and hyperplasia of the glomeruli and tubule cells occurs in the remaining kidney. This is transitory, and as soon as the kidney becomes adjusted to the increased functional demand the microscopic picture approaches the normal.

GEORGE C FIORELLA M D

BLADDER, URETHRA, AND PENIS

Zampieri G. A Grave Developmental Defect of the Bladder and Colon (Di un grave difetto di sviluppo della vescica urinaria e del colon) *Ann ital. di chir.* 1932 ix, 637

The author reports a carefully studied monstrosity, a five-months' fetus which was delivered by embryotomy. After spontaneous birth of the head, expulsion was completely arrested. Perforation of the thorax and subsequent removal of its contents were of no avail but on extension of the perforation into the abdominal cavity several liters of clear fluid were released and delivery was accomplished immediately.

Anatomically it was easy to reconstruct a large cyst which distended the abdomen to tremendous proportions.

Externally the genitals were represented by a small empty scrotum separated by a median raphe. Above and in front of the scrotum there was a very rudimentary penis perforated at its tip by a meatus. The urethra extended backward for a distance of 1 cm. from the meatus and then ended blindly.

The penneum lacked a median raphe. No trace of an anus—no depression and no fossa—could be found. No anal musculature or sphincter in any degree of development could be discovered. Accordingly there was a true aplasia of the anus and perineum instead of a simple atresia.

The pelvis was not yet ossified. It was smaller than normal and was compressed from side to side in its inferior portion so that the ischial spines were in close proximity.

The incised abdominal walls were very thin.

An enormous cyst filled the abdominal cavity displacing the viscera upward against the diaphragm. The cyst was formed by a large posterior sac which arose from the small pelvis and extended upward and backward along the vertebral column to the last thoracic vertebra and a smaller anterior sac which extended to the umbilicus and there fused with the umbilical cord. The smaller sac, which was pyriform was separated from the posterior sac by a deep sulcus. The cavities of the two sacs communi-

cated freely. The walls of the sacs were only very loosely adherent to the parietal peritoneum. No free fluid was found in the abdominal cavity.

The anterior sac corresponded to the urachus.

In addition to upward displacement, the kidney presented a trilobed structure with ureters that were normal except for an altered course and irregular length. Both of the ureters emptied into the anterior cyst through a small sulcus.

The prostate and seminal vesicles could not be found. The testicles, epididymis, and vas were discovered in the abdominal cavity.

The distal portion of the small intestine entered the posterior wall of the posterior sac, where it became lost. The structure of this sac with its tenae and appendices epiploicae corresponded to the colon.

Cross-sections of the umbilical cord demonstrated only one vein and one artery.

Sections for microscopy were taken from the kidneys, abdominal walls, umbilical cord, and the walls of the anterior and posterior sacs.

On microscopic examination, the wall of the anterior sac (urachus) showed four distinct layers: a tunica of loose connective tissue lined by an endothelial layer, the peritoneum, a thick muscular coat, and submucosa and mucosa of flat, polystratified epithelium. The wall of the posterior sac showed the same histological structure but was thicker. The muscularis of the posterior sac was more distinct and presented an external circular and an internal longitudinal layer analogous to the external and internal layers of the normal intestine. The submucosa was rich in capillaries and lymphatics. The mucosa consisted of high, flat polystratified epithelium lacking a true basal membrane and muscularis mucosae. Glandular formation was absent in all sections.

In the author's opinion the malformation was a persistent cloaca interna or endodermica with notably hypertrophied and dilated walls.

GEORGE C. FIDOLA, M.D.

Phillip, L.: Endoscopic Findings and Operative Endoscopic Technique in the Dysectasias of the Neck of the Bladder Exclusive of Prostatic Hypertrophy (Constations endoscopiques et technique opératoire endoscopique dans les dysectasias du col, hypertrophie prostatique exclue) *J. Fac. Méd. et Chir.* 1935, xxxiv, 57.

The author discusses "prostatism without prostatic hypertrophy." Persons with this condition have all of the symptoms of obstruction of the neck of the bladder without enlargement of the prostate as determined by rectal examination. Phillip prefers the universal cysto-urethroscope for examination. At operation performed under caudal block anesthesia, he makes radiating incisions around the circumference of the neck of the bladder with an electrical sound scalpel. In the lower half he makes one median and two lateral incisions. When the incisions are guided by rectal palpation there is no danger of going too deep. Phillip prefers an

alternating current with very short wave lengths. With the endoscopic electrical curette he removes a deep slice or the entire neck of the bladder.

After the operation a catheter is kept in the bladder for forty-eight hours and irrigations are given until the washings are clear. The patient may be allowed to get up on the third or fourth day or may be kept in bed for from seven to ten days.

If necessary the operation may be repeated after three weeks.

F. M. COOMBS, M.D.

Costantini, P.: Traumatic Rupture of the Urinary Bladder and Attacks of Uremia (Scoppio traumatico della vescica urinaria e attacchi uremici) *Clin. chir.* 1935, viii, 952.

The author reviews the factors involved in rupture of the bladder by direct and indirect trauma and muscular violence and discusses those influencing the results and responsible for the high mortality.

He reports the case of an aviator who was severely injured when his plane crashed. Apparently he was struck on the back by the motor. The accident was followed immediately by pain in the lower part of the abdomen. When the patient was taken to the hospital he had an urgent desire to urinate although he was in great shock. Catheterization yielded bloody urine. The abdomen was distended, extremely tender to palpation, and somewhat rigid. Exploration was done under spinal anesthesia. The space of Retzius was densely infiltrated with urine and a large amount of urine was present in the peritoneal cavity. The bladder wall was not simply lacerated or punctured, but rather fragmented, and there seemed to be definite loss of substance in the region of the dome. The trigone was intact. A catheter having been passed down the urethra in a retrograde manner the fragments of bladder were sutured about it as well as possible. The result was a small tube-like bladder about 10 cm. long and a few centimeters in diameter. There was an associated fracture of the pelvis.

The operation was followed by oliguria, several convulsions, and uremia, but recovery resulted and ultimately urination became normal. Roentgenograms taken with the use of a contrast medium revealed a fairly normal bladder outline which, in view of the findings at operation, was unexpected.

This case is reported with special reference to the apparent regeneration of the bladder and the occurrence of uremia. The author reviews some of the literature on regeneration of the urinary bladder and concludes that the case he reports was an instance of such regeneration. In discussing the uremia he cites many of the theories regarding it. He believes that the serious postoperative condition of his patient was a combination of shock and toxemia from the urine in the peritoneal cavity and the subcutaneous tissues. He believes that the oliguria of the first few days contributed to the uremic condition. He states that the ultimate outcome in such cases depends largely on the severity of the renal damage.

A. LOUIS ROSE, M.D.

Moriconi L.: A Contribution to the Study of Bladder Tumors (Contributo allo studio dei tumori vescicali) *Ann Ital di chir* 1932 12, 670.

The author emphasizes the value of the cystoscope in the diagnosis, differentiation, and treatment of malignant and benign tumors of the bladder.

He uses the classification of Christeller, dividing bladder tumors into those which are epithelial and those which are non-epithelial.

The incidence of epithelial tumors has been variously reported at from 90 to 95 per cent. Non-epithelial tumors are comparatively rare. Moriconi has had no experience with non-epithelial tumors but cites the observations of others regarding them.

Attention is called to the statement of Christeller and Stenius that malignancies are very frequently transformations of epithelial tumors.

Of twenty bladder tumors reviewed two were malignant. Fifteen (87 per cent) of the benign tumors had a para-arterial origin. All but two of the neoplasms were finely pedicled. There was no instance of diffuse papillomata or vesica villosa. The patients ranged in age from twenty-five to sixty years. Only three of them were females.

In seventeen of the eighteen cases of benign tumor the chief sign of the condition was the appearance of blood in the urine, usually at the end of urination. The duration of symptoms ranged from two to twenty years.

The differentiation of malignant tumors from benign tumors by means of the cystoscope was confirmed in all cases by histological examination.

In five cases the causative factor was believed to be gonorrhea. In one case the tumor was associated with calculi. In no case were diverticula found. No particular difference was noted in the incidence of the tumors in persons engaged in different professions or trades.

Of the eighteen patients, one was treated with diathermy through the cystoscopic sound and seventeen were treated through a suprapubic cystotomy—six by the diathermocoagulation of Beer seven by the Heitz Boyer fulguration method and five by diathermocoagulation plus fulguration to the margins of the neoplasm.

In the two cases of malignant tumor—cases of papillary carcinoma with the same histological structure—the results were poor, the patients dying within a year one from pulmonary metastasis and the other from generalized metastases.

GEORGE C. FINOLA, M.D.

André and Grandineau: The Treatment of Malignant Tumors of the Bladder (Traitement des tumeurs malignes de la vessie) *J d'uroi méd et chir*, 1932 xxxiv 416

Surgeons are not always agreed in regard to the malignancy of bladder tumors. Many pedicled tumors are epitheliomata, but as the malignant degeneration is often limited to the surface the cancerous focus can frequently be avoided. In cases of sessile and infiltrated tumors which invade the

lymphatics early final cure is rarely possible even if there is no local recurrence.

Surgeons differ on many points in regard to treatment but on some points there is general agreement. In cases of pedicled epitheliomata in which the tumors are few and no larger than a nut, treatment with the high frequency current can be given through the cystoscope. Some American surgeons apply radium through the cystoscope. If the tumors are very large or numerous the bladder must be opened. Excision without complete resection followed by application of the high frequency current to the wound gives good results with little risk. If the tumors are numerous, total cystectomy may be indicated.

Sessile or infiltrated epitheliomata must be treated by cystotomy if the patient's condition permits operation. If there is a single hard tumor of the upper part of the bladder partial resection may be sufficient. If the tumor is large the immediate results may be satisfactory but the lymphatics are generally already invaded and recurrence develops. In cases in which there is a single large tumor in the lower third of the bladder the most frequent site partial resection is generally followed by recurrence. Even total cystectomy is rarely effective permanently unless it is performed early and in the early stage the patient generally refuses it. In the early stage radiotherapy may be as effective with little risk. In cases of multiple small tumors which are close together and in the upper part of the bladder an extensive partial resection may be sufficient. If not, total cystectomy is necessary. The only treatment for soft encephaloid tumors is total resection.

If the patient's general condition is too poor for radical operation, electrocoagulation may be done through a cystotomy incision. In some cases of tumors that have not completely invaded the bladder wall it results in cure and in many it gives complete and prolonged palliation. Radium treatment is useless if invasion of the lymphatics has occurred and cannot be employed if the general condition is very poor or the tumor is very large. It can be used effectively for low tumors that are not too large. In some cases kidney function can be improved by hygienic and dietetic measures and arresting the hæmaturia by deep roentgen therapy. The intravenous injection of mesothorium and cystoscopic electrocoagulation may bring about considerable and sometimes permanent improvement.

In spite of modern methods the treatment of malignant tumors of the bladder has not made much progress. However the fact that a cure has been obtained in some cases should encourage efforts to make an early diagnosis. Early diagnosis would be possible much more often if a cystoscopic examination were made in every case of hæmaturia.

In the discussion of this report, RICHES cited good results from a combination of radium and surgery. HOCOX said that in his opinion all true tumors of the bladder are malignant. Urologists are not very skilled in the use of radiotherapy and a closer co-

operation between radiologists and pathological anatomists is necessary.

ORANSON said that he uses cystoscopic electrocoagulation for small tumors and resection for larger ones. He follows the patients up for years with cystoscopic control in order that he may detect and treat recurrences early.

GAYET stated that diathermia is the treatment of choice for polyps and surgery the treatment of choice for malignant tumors. He has not had good results from radium irradiation.

CARLEIN reported that he had operated on fifty-one cases of tumor of the bladder with a mortality of 5 per cent. He advised against too radical operation such as total cystectomy and also against fulguration through the urethra. He recommended for all cases cystotomy followed by deep and prolonged thermocauterization or partial resection of the mucous membrane with suture.

Dr. SMITH said that he had obtained the best results by cystoscopic electrocoagulation in cases of small tumors and by cystotomy with thermocauterization or electrocoagulation in cases of large tumors.

BORCKEL stated that cystotomy with electrocoagulation is the treatment of choice for sessile or infiltrated cancers of the lower part of the bladder if the tumors are too large to permit cystoscopic electrocoagulation.

LEPOUTRE said that the only logical operation for cancer of the bladder is early and total cystectomy. At present this is always performed too late.

LE FUR said that the high-frequency current should be used by the cystoscopic route for small tumors and after cystotomy for large ones.

GIRARD stated that almost all malignant tumors of the bladder come for treatment too late. The only

way to improve the results is to make an earlier diagnosis by carrying out a systematic examination for cancer in every case of hematuria that is not manifestly caused by nephritis.

DARRET advised electrocoagulation of exuberant masses and the implantation of radium needles in the base of the tumor for from five to seven days. He reserves cystectomy for cases in which radium therapy and electrocoagulation fail.

LYONS said that in most cases only palliative treatment is possible. He advised careful daily irrigation of the bladder and even a permanent hypogastric incision. He regards electrocoagulation as a valuable palliative measure.

PARIN stated that total cystectomy is indicated in the majority of cases and would be more successful if it were performed earlier. Physical treatments are only palliative. The best palliative treatment is derivation by double iliac ureterostomy.

PARTEAU said that treatment with the high-frequency current after suprapubic cystotomy is of great value. Cystectomy is a very serious operation and does not give permanent results. Radium and roentgen therapy are not effective.

HENRI BOTTICADVOCATED operation with the electric knife. He said that this prevents shock and increases the limits of operability of malignant tumors of the bladder.

GOUVERNEUR recommended electrocoagulation for small pedicled tumors and partial cystectomy with the electric knife for larger ones. He believes that total cystectomy should not be used. He stated that double ureterostomy is indicated in advanced cases with functional disturbances. As operation should be done early he advised cystoscopic examination in all cases of hematuria.

AUDREY Goss MORGAN, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS ETC

Blagard J D : Longitudinal Bone Growth The Influence of Sympathetic De-Innervation *Ann Surg.*, 1933, xcvi, 374

From an experimental study of the influences affecting longitudinal bone growth Blagard concludes that this growth is not influenced by sympathetic de innervation and that there is no experimental evidence to justify the performance of sympathetic ganglionectomy to accelerate bone growth. In his opinion the best method of correcting discrepancies in length are shortening of the long extremity by osteotomy arrest of the longitudinal growth of the long extremity, or lengthening of the short extremity by distraction.

PAUL C. COLONNA, M.D.

Littlejohn C. W. B. : Osteochondritis, and in Particular Osteochondritis Dissecans. *Australian & New Zealand J Surg.*, 1933, li, 278.

Littlejohn says that the application of the suffix 'itis' to the disease under consideration is unjustified and a new name is desirable. The condition has been ascribed to trauma, traumatic circulatory disturbances, quiet necrosis infection, and constitutional factors. Littlejohn believes the theory attributing it to trauma is the most logical. This theory is supported by the fact that the condition occurs most frequently in men in good health. Moreover the loose bodies and irregularity in the condyles can be explained on the basis of a subchondral fracture. A fall on the flexed knee may transmit a force through the patella to the medial condyle the location of 95 per cent of the lesions. The subchondral bone which is a dense layer surrounding the spoozy bone, is broken, whereas the cartilage which is flexible is not. The result is necrosis of the injured segment and its eventual separation as a loose body. The loosening process is probably due to growth of the surrounding cartilage which undermines and lifts the fragment from its bed, and to the rocking motion of the joint which completes the separation.

The author reports ten cases. In some of them examination revealed completely loose bodies and depressions in the condyle from whence they presumably came. In others partly detached fragments with hinged pedicles were found. Still others showed areas of apparent fracture under the cartilage without separation. In most of the latter subsequent roentgen ray examination showed reattachment.

In reviewing the history of the condition the author says Monroe in 1726 perceived that

corresponding roughly to the size and shape of the loose body there was a hiatus on the medial condyle and the obvious inference was that the fragment was merely a chip struck off by external violence

It is suggested that other forms of osteochondritis, such as Koehler's disease Kummel's disease and Legg Perthes disease, may be due to trauma which is not sufficient at the time to justify immobilization but causes after-effects demonstrable by roentgen examination. WILLIAM ARTHUR CLARK M.D.

Heydemann E. R. : Bone Atrophy Following Trauma (Ueber posttraumatische Knochenatrophie) *Zentralbl f Chir.* 1933 p 2949

According to the theory most generally accepted Snedec's atrophy depends upon trophoneurotic disturbances following inflammation and trauma and involves bones and soft parts to the same degree. The author asked himself the question How is it then, that the bone atrophy is always found first in the region of the metaphysis and only secondarily in the epiphysis and diaphysis, even in regions where special articular changes are absent? He believes he has found the answer to this question in the vascular supply since, in addition of the blood the zone of the best vascular supply is most apt to give off calcium most readily and to the greatest extent. The best supplied zone of the bones of juvenile persons is the metaphysis. Therefore it is here, just as in adults in whom the vascular supply of the diaphysis has become poorer that the calcium deficiency becomes roentgenologically demonstrable earliest. The author shows these phenomena in fifteen roentgenograms of fractures of the diaphysis. From the results of experimental studies on dogs with disturbances of the anterior lobe of the pituitary gland he concludes that disturbances in the function of this gland may lead to calcium deficiency very rapidly

In the discussion of this report, KALLIUS cited the case of a man thirty-eight years of age who, seven weeks after a jump from a height of 34 meter had a swelling and livid discoloration of the right foot and without fracture, a considerable calcium deficiency of the entire skeleton of the foot. Kallius regards these findings as evidence of the influence of vasomotor disturbances. In another case cited an organic cerebral disease led to severe atrophy of an arm and almost cystic atrophy of the lunate bone

KOENIG cited the findings of Schmorl, Schmidt and others who discovered focal degenerations with blood residue but without fracture in the vertebral bodies following trauma. He called attention also to the theory of Goerke and Greifenbein that the bone cells respond to subfractural injuries with local

necrosis, and to the theory of Pommers regarding the development of bone cysts from traumatic hemorrhages.

REEDER reported the findings of an investigation which he carried out with Never. Studies of the calcium metabolism in isolated surviving bones showed that in venous perfusion, calcium is washed out from the bones, whereas in normal perfusion the calcium content of the arterial and venous blood remains unchanged.

KAPPEL stated that he is unwilling to exclude the influence of the sympathetic nervous system. He believes it possible that bone atrophy following trauma may be produced or increased by psychogenic influences.

PURCE (Z)

Elmalle R. C., Fraser F. R., Dunhill T. P., Vick, R. M., Harris, C. P., and Dauphinee, J. A.: The Diagnosis and Treatment of Generalized Osteitis Fibrosa with Hyperparathyroidism. *Brit. J. Surg.* 1933 21, 479.

Generalized osteitis fibrosa associated with hyperparathyroidism is an indication for exploratory operation on the parathyroid glands. The authors report the following three cases.

Case 1: The patient was a woman forty-two years old who gave a history of pain in the shoulder and arm followed by spontaneous fracture of the humerus. Curettement of cystic cavities in the humerus was done. Rarefaction occurred in the tibia and thickening in the skull. The serum calcium ranged from 9 to 14 mgm. per 100 cubic centimeters. The history covered a period of ten years. Examination by the authors revealed muscular atrophy, prominence of the forehead, a recent fracture of the humerus, irregularity of all long bones, and bowing of the humeri and tibiae. The right lobe of the thyroid was larger than the left. In May 1930 a parathyroid tumor was removed from the left side. The operation was followed by tetany but later this ceased. In 1932 the patient was working hard on a farm, roentgen-ray examination showed definite improvement in the bones and the serum calcium was normal. In spite of frequent traumas there had been no more fractures.

Case 2: The patient was a woman twenty-six years old who complained of aching in the bones which was steadily growing worse and had sustained a fracture of the femur from slight trauma. At examination the left humerus was found expanded and the tibia irregular. In the lower pole of the right lobe of the thyroid there was a localized swelling. Removal of a parathyroid tumor on the right side was followed by a gradual decrease of the symptoms. Twenty months later the patient appeared entirely normal.

Case 3: The patient was a woman twenty-three years old who had had bone deformities from spontaneous fractures since the age of sixteen years. Frequently she had been confined to bed. Examination showed muscle atrophy, enlargement of the skull, twisting of the spine, prominence of the ster-

num, and bowing and terminal expansion of the long bones. The basal metabolic rate was -23. A parathyroid tumor was removed in January 1931. When the patient was last seen, in May 1932 she was well and active, had gained weight, and was able to walk without crutches but very little change was apparent in the bone deformities.

Comparative roentgen studies made before and after removal of the parathyroid tumor showed that the operation was followed by increased density of the bones, disappearance of the mottling in the skull, and, in some cases, a filling in of cystic cavities such that the area became more dense than the surrounding bone.

During the period of observation, the diet was carefully regulated and chemical studies of the blood were made. In two cases the serum calcium was abnormally high and in the third case a high normal was found. In all, the phosphorus was abnormally low. After the operation the calcium content of the blood decreased. In one case the phosphorus showed a slight rise but in the two others it was little altered.

At operation, the parathyroid bodies may not be found in their normal position. In one of the cases reported the parathyroid tumor was deeply embedded in the thyroid tissue. The tumors removed were from 2 to 3.5 cm. in length and from 1 to 3 cm. thick. Most of them were oval.

The diagnosis of generalized osteitis fibrosa is usually not difficult, especially in the advanced stage of the condition with pain, fractures and definite roentgen-ray findings. Operation on the parathyroid glands is justified only if there is also a well-established diagnosis of hyperparathyroidism. This diagnosis requires a study of the blood for increased calcium and decreased phosphorus and an examination of the thyroid region for tumor.

WILLIAM ARTHUR CLARK, M.D.

Bellin M.: Parathyroidism in Reference to Orthopedic Surgery. *J. Bone & Joint Surg.* 1933, 25, 120.

The author distinguishes the following types of parathyroidism.

1. The vertebral type, manifested chiefly by kyphosis and compressed vertebrae and usually progressing slowly. This is the type starting with increasing roundness of the back, pathological fractures of the vertebrae, and aching in the back and legs.

2. The infantile type. This is usually more rapid. It begins with general intestinal and urinary symptoms which are followed quickly by skeletal pains and deformities. Roentgen ray examination shows general decalcification, cyst formation, and giant-cell tumors. The tumors are often diagnosed as chondromata. Adolescent coxa vara and slipping epiphysis may belong among these cases.

3. The arthritic type.

4. The Paget type. In this type, pathological, microscopic, and clinical examinations show trans-

tory stages between osteitis fibrosa cystica and Paget's disease. The results of parathyroidectomy in Paget's disease confirm the theory that the two conditions are identical and can be controlled by parathyroid removal. The author has operated on three cases of the Paget type. The first was seemingly a case of Paget's disease of the femur in which other decalcifying lesions were found. The second and third were cases of typical Paget's disease with thickening of the skull. Parathyroidectomy was followed by immediate relief of the pain and disappearance of the hyperostotic outline of the skull.

5 Types in which muscular hypotonia or gastrointestinal symptoms are more prominent than skeletal symptoms. Weakness may be shown by recording the milliamperes needed to stimulate muscular contraction, by moving pictures, and by electrocardiograms.

The author advises that conservative treatment by an anti rachitic régime be tried before surgery is considered.

ROBERT V. FURSTEN, M.D.

Scott, G. Brailsford, J. F. Muckle, S. L., Villandrè, G. E. and Others. A Discussion on the X Ray Diagnosis and Treatment of Osteo-Arthritis. *Proc. Roy Soc Med. Lond.*, 1933 xxvi, 335

Scott stated that the first roentgenographic change characteristic of osteo-arthritis of the hip joint is destruction of the cartilage of the joint. The second stage of the condition is characterized by the formation of new bone. The fringe osteophytes which are deposited around the head of the femur and the edge of the acetabulum and the acetabular bone deposited in the lower segment of the acetabulum cause a gradual filling of the cavity with displacement of the head of the femur out of the acetabulum. The third stage is characterized by cavities in the head of the femur or in the bone around the acetabulum. In discussing osteo-arthritis of the hands, Scott said that Heberden's nodes are usually the end result of chronic gout.

WATT said that when the disease is limited to one or two large joints or an isolated group of small joints and has been present for no longer than a year deep therapy should take precedence over any other form of treatment. In the acute stage it is not advisable and in the atrophic types of arthritis it is of little or no benefit. Of the cases in which it is indicated, a symptomatic cure or marked improvement can be expected in 60 per cent and improvement in 15 per cent.

BRAILSTORN stated that repeated trauma in the form of blows or strains on the articular surfaces plays an important part in the development of osteo-arthritis. Toxic absorption is an added factor. Successful results appear to be obtained only with treatment which gives rest to the affected joint or diminishes the activity of extra-articular proliferation.

MUCKLOW said that cases with the most marked osteophyte formation are the most likely to respond

to roentgen ray treatment. Following roentgen ray treatment, graduated muscle contraction is of great help. Roentgen ray treatment is the procedure of choice for hypertrophic osteo-arthritis.

VILVANDRÉ said that there are no cysts in osteo-arthritis. The light areas seen in the roentgenograms represent sites of osteoporosis or atrophy from disuse. Trauma and foci of infection play an important part in the production of osteo-arthritis. Vilvandré deprecated too fine a subdivision of cases of osteo-arthritis. He believes that when osteophytes are found and there is pain with limitation of movement the diagnosis of osteo-arthritis is sufficient.

BATTEN stated that the intensive diagnostic method followed by the removal of teeth, tonsils or portions of the gastro-intestinal tract had been employed to excess. However it is important to search for foci of infection and treat them. Batten has seen extraordinary clinical cures and relief after deep roentgen therapy.

CONNELL mentioned the uterine cervix, hemorrhoids, and the prostate as possible sites of foci of infection.

NELIOAN in referring to Scott's statement that Heberden's nodes are evidence of gout said that in some of the cases he had found the uric acid content of the blood not raised.

BARCLAY and HARDMAN reported that small doses of roentgen irradiation 125 kv seem to produce very good results in osteo-arthritis.

NORMAN C. BULLOCK, M.D.

Leibovici, R. and Wells J.: Articular Osteochondromatosis (L'osteocondromatose articulaire). *Presse Méd. Par.*, 1938 xl, 1930.

In examining specimens of loose bodies removed by operation from an elbow joint, the authors found important evidence supporting the theory that such bodies are of benign neoplastic origin.

The patient was a man thirty-eight years of age who had a swelling in the right elbow which slowly increased in size for two years, causing a progressive decrease in the range of motion of the joint. Examination showed swelling on the medial aspect above the condyle in which numerous loose bodies could be palpated. Flexion was good and extension was possible to 165 degrees. Roentgen ray examination showed many loose bodies which were completely opaque and some which were of less density like cartilage. The loose bodies varied in size. Two years later the symptoms had increased, the elbow was painful, and extension was limited to about 120 degrees.

Through a lateral incision, about thirty fibrocartilaginous loose bodies were removed. Loose bodies which could not be reached through the lateral incision were removed about a month later through a medial posterior incision.

On pathological examination the bodies were found to have a fibrocartilaginous structure and to be partly calcified. There were no bony trabeculae. The peripheral layer was necrotic, and some of the

centers were fatty. No signs of an inflammatory reaction were noted. Loose bodies removed from the posterior olecranon region showed more bony structure than those removed from the anterior part of the joint. The condition suggested osteochondromatosis. It furnished new evidence in favor of Henderson's theory of the synovial origin of loose bodies. If abnormal synovia is not resected, recurrence may develop.

In cases of multiple osteochondromatosis there is no history of trauma and no lesion in the articular cartilage from which the bodies might have had their origin, as in osteochondritis dissecans.

Röntgen ray treatment may inhibit the formation of more osteochondromatosis by sterilizing the synovial membrane. Operation is indicated only to restore lost function.

WILLIAM ARTHUR CLARK, M.D.

Galbal, J., and Gentin, R.: Traumatic Disinsertion of the Lower Tendon of the Brachial Biceps (*Déinsertion traumatique du tendon inférieur du biceps brachial*). *Rev. d'Chir. Par.* 1933, 8, 703.

Two cases of disinsertion of the lower tendon of the brachial biceps are reported. This lesion is relatively rare, but is more frequent than avulsion of the tuberosity. In both of the authors' cases the patient slipped and caught a support in such a way that the weight of the body was suspended by the right arm. In some of the cases reported the condition was caused by slight contraction of the muscle but under such circumstances pathological lesions, most frequently gummatous or gummatous infiltration, were present before the accident.

Sometimes the pain is so intense that the patient drops the weight he is lifting or lets go of the support to which he is holding. The pain is accompanied by a cracking sensation. One patient said he heard a sound like the tearing of cloth and had the feeling that his flesh was being torn. There is immediate loss of function.

A muscle swelling is seen at the middle of the anterior surface of the arm. On relaxation, it is smooth soft and compressible, but on flexion it rises toward the upper part of the arm and becomes harder and more prominent. At the elbow there is an abnormal depression in place of the tendon. There is also a hematoma, and later ecchymoses appear.

In muscle hernia the body of the biceps is in its normal position, while in tendon rupture it rises toward the shoulder. In hernia the tendon is perceptible on contraction. Complete muscle rupture shows, instead of a swelling, a depression in the middle of the arm between the fragments which is exaggerated when an attempt is made to flex the forearm. The muscle does not rise, and there is a marked functional disturbance. In incomplete rupture differentiation is more difficult, but the normal tendon can be felt at the bend of the elbow.

Operation is required in practically all cases. In some the tendon and periosteum can be sutured.

Kerschner fixed the tendon to the anterior surface of the bone. This does not restore the supinator function of the biceps, but this function can be taken over by other muscles, particularly the supinator longus. The authors prefer Schmieden's method which consists in suturing the tendon of the biceps to that of the brachialis anticus as near as possible to its attachment to the ulna; the vessel and nerve bundle of the elbow being placed between the brachialis anticus behind and the biceps in front. In the cases in which the authors performed this operation the biceps showed a decrease in function of only 5 per cent after five months. Supination was decreased 40 per cent, but later became almost normal after hypertrophy of the other supinators. Whatever method is used, the sponenrotic expansion of the biceps should be reconstructed as completely as possible. AUDREY GORE MORROW, M.D.

Schmorl, G.: Displacement of Intervertebral Disk Tissues and Its Results (Ueber Verlagerung von Bandscheibengewebe und ihre Folgen). *Arch. f. Klin. Chir.* 1933, clxxix, 240.

Schmorl stated that the so-called "persistent vertebral body epiphyses" recently discussed by many should not be considered as such. They are in reality separations of the anterior parts of the vertebral body edges caused by intervertebral disk tissue pushed into the spongiosa of the vertebra. A prerequisite therefore is a very elastic gelatinous nucleus. These separations of the edge occur practically only on the upper borders of the vertebral bodies and usually in the lordotically curved lumbar portion of the spine. At the step-shaped excavation, where the posterior edge of the ledge of the vertebral body comes in contact with the cartilaginous plate of the vertebral body, the intervertebral disk tissue accommodates itself in an oblique anterior and downward direction and thereby causes separation of a part of the ledge and the spongiosa of the adjacent vertebral body.

Of 400 vertebral columns carefully examined, the author found these changes in 20. As a rule they were found in older persons. In several instances separations from several vertebral bodies were visible. The separation may be complete, the separated piece being completely movable, or incomplete, the separated piece being still held in position by connecting fibers. Of greatest importance clinically is the fact that the penetration of the intervertebral disk tissue progresses very slowly and care is necessary to avoid making a diagnosis of fracture of the vertebra. The author has observed avulsions of a similar nature resulting from a single trauma, but these are considerably more rare than the slowly developing separations. In the differential diagnosis it must be borne in mind that typical avulsions are most common at advanced ages; that they are usually found in the lumbar portion of the spinal column and very rarely in the lower thoracic portion; and that they seldom appear in several vertebrae. JOURNAL OF (2)

Ingelram, P., and Minne J. Psoriasis in the Child and Adolescent (*La psoriasis de l'enfant et de l'adolescent*) *Arch. franco-belges de chir.*, 1930, xxxii, 1035.

In the course of the last ten years the authors have seen eleven cases of suppuration of the psoas muscle in children between two and fourteen years of age. Occasionally this condition is caused by wounds, but usually it is metastatic from a focus of infection elsewhere such as appendicitis, perinephritic abscess and osteomyelitis of the pelvis. In women, it may be caused by puerperal infection.

The anatomy of the region, particularly the lymphatic tracts, is reviewed.

The first symptom is usually pain in the iliac fossa. Sometimes enlargement of the inguinal glands is found. The patient becomes fatigued easily, jumps, and soon feels intense and continuous pain irradiating either to the lumbar region or more frequently along the thigh to the knee. Finally walking becomes impossible and a deformed attitude of the limb results. Flexion occurs in all cases, abduction with external rotation in most cases, and internal rotation in a few cases. The fact that slight movement of the coxofemoral joint is possible differentiates the condition from arthritis. Palpation discloses a doughy swelling in the iliac fossa. Early signs described by others are intense pain on pressure over the external part of the iliac fossa a little inside the anterosuperior spine of the ilium and pain on pressure over the lesser trochanter. None of the authors' cases was seen in this early stage. As the suppuration develops the swelling may extend even to the pelvic region and fluctuation may be felt. There is always muscular contraction of the wall of the abdomen near the suppuration, but when palpation is done carefully beginning at a distance from the suppuration, the wall of the abdomen is found to be soft and there is no rigidity at McBurney's point. The suppuration has a tendency to progress toward Scarpa's triangle where the femoral insertions of the psoas muscle are located.

The patient's general condition is serious. The temperature is from 39 to 40 degrees C. and the pulse is rapid. There is a cold perspiration, and the patient's color is like that of a dog. The urine is scanty and highly colored. In some cases the patient presents a weakened condition with a thready pulse as in septicemia. If operation is not performed, death results from septicopyemia.

The treatment indicated is drainage of the abscess. If this is done in time the prognosis is good. Various routes may be used but it is most important to drain at the lowest point. As a rule the anterior route is best. As the condition is serious, the patient should be kept under close observation. In one of the authors' cases the temperature rose again and signs of purulent coxofemoral arthritis developed a week after evacuation of the abscess. As the serous bursa of the psoas muscle frequently communicates with the serous cavity of the joint

the joint may become infected by this route. In the case cited a number of operations were necessary.
ANDREY GOSS MORGAN, M.D.

Klenboeck, R. Juvenile Malacia of the Neck of the Femur of Hypophyseal Origin (Ueber juvenile Schenckelhalmalacia hypophysaeren Ursprungs) *Ztschr. f. orthop. Chir.*, 1932 LVII, 408.

Coxa vara adolescentum, which the author calls juvenile malacia of the neck of the femur was first described by Mueller in 1885. Klenboeck reports a study of eight cases. He states that the acute changes are usually found in boys of corpulent build between the ages of fourteen and eighteen years. Sometimes adiposogenital dystrophy or lymphatic chlorotic constitution is mentioned in the records of such cases. Pain and rapid turning of the affected hip moderate external rotation, and limitation of motion, especially abduction, are the clinical signs of the condition. The neck of the femur is deformed as in coxa vara and the head of the femur is retroverted, mushroomed, decalcified, and flattened. The roentgenogram shows a shifting of the head on the softened neck. In its earliest stages the disease is usually latent, but may be rendered acute and painful by a strain. The acute stage may persist for months or years.

The author believes that in his six active cases he could recognize endocrine disturbances. In the roentgenogram the most striking finding aside from the conical tapering off of the deformed head of the femur is a patchy area of decalcification which in the later stages is changed into a sclerotic marginal zone. In the course of months or years, with or without treatment, bony healing occurs with the formation of a sort of knob on the head of the femur and a deforming arthrosis. In two of the authors' cases those of men over twenty and thirty years of age whose first symptoms were noted at the time of puberty the roentgenogram disclosed shortening of the femoral neck and a dorsal knob on the neck which markedly hindered abduction.

In Klenboeck's opinion, the cause of the trouble is an endocrine disturbance induced by disease of the hypophysis with consequent weakening of the skeletal system which is overburdened by the excessive body weight. As a result there occur in the region of the growth zone macroscopic fractures and aseptic necroses which are of endogenic origin but affected by exogenic influences. Klenboeck therefore suggests designating the condition as "juvenile hypophyseal malacia of the neck of the femur."

The disease must be differentiated from congenital coxa vara Legg-Calvé-Perthes disease, of the head of the femur arthritis deformans of the adult, tuberculosis with marked atrophy and destruction of bone painful gonorrheal arthritis with a tendency toward ankylosis multiple metastases from carcinoma lymphogranulomatous xanthomatosis late rickets true osteopsathyrosis of children hunger osteopathies osteitis fibrosa Paget's disease of old persons and traumatic fracture of the femoral neck.

In the active stage the treatment should be conservative orthopedic. Resection of the head of the femur has been abandoned. Hypophyseal preparations should be administered. In the later stages with marked deformity linear osteotomy may be considered.

DIXON (2)

Loewy R.: Knee Flopping (*Le sauchage du genou*)
Bull. et mem. Soc. d' chirurgiens de Par 933, révé
323.

In 1915 the author observed a case of considerable effusion of the knee following torsion without an osseous or meniscal lesion. This effusion, which was very painful, was not punctured and persisted for about a month. It was slowly absorbed, but considerable disability persisted. Suddenly without apparent cause, the injured leg gave way without pain and the man fell to the ground. Examination revealed no laxity of the articular ligaments, effusion, abnormal play of the patellar tendon, or meniscal tenderness. There was nothing to explain the sudden flopping. For a while thereafter it recurred many times daily. The patient was obliged to take precautions against its recurrence. Later the attacks became less frequent.

Since observing this case the author has watched for similar phenomena in cases of knee injuries and has noted them quite often, whether the traumatism was a simple torsion or a more complicated injury. The flopping ("*sauchage*") usually follows traumata which, in the absence of tearing of the meniscus or serious osseous lesions, cause hyarthrosis or hamarthrosis. It occurs after the hyarthrosis or hamarthrosis has disappeared and there is no longer any pain or other clinical symptom.

The author is unable to offer a satisfactory explanation for the phenomenon. The suggestion has been made that it is due to inhibition of the nervous force maintaining the tonus of the quadriceps, but if this is correct it is necessary to explain why such an inhibition should occur without an appreciable cause. In the cases observed by the author there was a kind of heaviness of the limb which had persisted for from ten to fifteen years and was noticed especially when the patient was physically or mentally fatigued or during changes in the weather.

Manipulative treatment does little good and may do much harm. The author concludes that as a preventive measure persons with a knee effusion should wear for some time a canvas or leather support extending above and below the knee.

ELLA M. SALMONSKY.

Kimmelstiel, P., Krenner K., and Richter H.: Osteochondritis necroticans of the Sesamoid Bone of the First Metatarsal (Osteochondritis necroticans fündens der Sesambeine des 1. Metatarsale). *Arch. f. klin. Chir* 93, 1933, 403.

The authors discuss a frequently observed new disease which belongs to the group of insufficiency conditions of the foot and is called "osteochondritis" or "chondritis necroticans."

This disease is localized in the sesamoid bone of the great toe. In order to study it, very detailed anatomopathological examinations of the sesamoid bone were necessary. The sometimes very delicate and complicated changes in the sesamoid bone are shown by numerous photomicrographs. A total of eighty cases were studied.

The condition seems to have no particular age incidence. The predominant changes are necrosis and solutions of continuity in the cartilage, the osteocartilaginous margins, and the margins between the cartilage and connective tissue. These changes are attributed chiefly to mechanical lesions.

A large number of clinically observed and treated cases are reported in detail. The chief clinical characteristics are pain at a typical site under the ball of the great toe and distinct tenderness to pressure in the region of the diseased sesamoid bone. The condition seems to occur more frequently in females than in males. In the diagnosis it must be differentiated from gout fractures, and postural defects. As a rule it runs quite a chronic course.

In general the treatment should be conservative. If conservative treatment is unsuccessful, the sesamoid bone should be removed.

The authors have studied thirty-five cases roentgenologically. The roentgenograms frequently showed fragmentation, vacuolation clearing, thickenings and crumbling. The microscopic findings do not always correspond in degree to the roentgen findings.

HOOK (2)

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS ETC.

Ottolenghi, C. E.: Economical Resection in Tuberculous Osteo-Arthritis of the Knee (*La resección económica en la osteoartritis tuberculosa de la rodilla*)
Rev. de chir. y traumatol. 1933 II, 219.

The author reviews the various methods of treating tuberculosis of the knee joint and says that resection is now generally regarded as the best procedure. He describes his method of resection and illustrates the steps of the operation. The resection is performed with the patient on a Putti table which makes it easy to apply the cast immediately without moving the patient. Spinal anesthesia is used. An Esmarch constrictor is placed around the root of the thigh and held in place with a Finschietto or Putti tourniquet, which ensures perfect hemostasis. In none of the author's cases has there been any secondary hemorrhage or other unfavorable effect from the use of the bandage. An inverted U incision is made with its arch just above the upper border of the patella and its ends on each side at the posterior end of the joint interspace. The skin and soft parts are sectioned and the flap from the quadriceps tendon is turned down. If adhesions are found between the patella and femur they are cut with scissors or a knife. When the upper part of the joint is exposed the leg is gradually flexed, the lateral ligaments and any adhesions

present being cut. The flexion is continued until the posterior surfaces of the condyles of the femur are visible, the proximity of the popliteal vessels being borne in mind. As soon as the joint surfaces are exposed all of the synovial membrane and soft parts that appear to be diseased are resected. The synovial cul-de-sac and any fungoidities contained in it are removed completely.

The knee is then flexed to 90 degrees, the tibia being displaced backward so that the lower end of the femur is completely exposed, and the joint surface of the femur is sawed off as economically as possible and with the formation of a convex surface. Removal of the diseased joint cartilage leaves a freshened bone surface. The resistance of this surface is tested with the back of a curette and any caseous cavities are curetted. The upper surface of the tibia is then sawed off with the formation of a concave surface into which the lower surface of the femur will fit. Here too any cavities are curetted. Only the joint surface of the patella is resected.

The leg is then straightened out and a careful examination is made to see that the bone surfaces are exactly adapted to each other. The leg is placed in flexion of about 5 degrees, which makes walking easier. The capsule and fibrous tissues are carefully sutured with reconstruction of the quadriceps tendon. The aponeurosis and skin are sutured without drainage. A well-fitting plaster cast is applied from the pelvis to the foot so that complete immobilization is obtained. A roentgenogram is taken to control the position. The case is left on for from five to six months, and at the end of that time another roentgenogram is taken. If ankylosis is complete, the patient is given an aluminum or celluloid gutter splint, with which he can walk.

Fourteen cases in which this operation was done are reported with roentgenograms.

STUDLEY GORE MORGAN, M.D.

FRACTURES AND DISLOCATIONS

Ireland J.: Late Results of Separation of an Epiphysis. *Ann Surg.*, 1933 xviii, 189.

Eighteen patients with nineteen epiphyseal separations were examined from seventy four days to seven years and one hundred and ninety two days following the epiphyseal separation. Sixteen of the separations were due to trauma and three to scurvy. Eleven patients were treated conservatively by closed reduction. Of these one had shortening and one had lengthening as measured in the roentgenograms, two had osseous union of the epiphysis to the shaft, one had deformity and one had poor function. None had arthritis. Two patients with three epiphyseal separations due to scurvy were treated by simple rest in bed without splints and the administration of antiscorbutic food and medication. One had shortening and deformity but neither had osseous union of the epiphysis to the shaft impairment of function, or arthritis. Of the five patients

treated by open operation all had subsequent shortening as measured in the roentgenograms, four showed shortening by external measurements, one had osseous union of the epiphysis to the shaft, and one, after removal of the epiphysis had deformity, poor function, and arthritis. The author concludes that open operation is to be avoided if the fragments can be approximated without it.

The outlook with regard to deformity and function seems to differ in the various epiphyses. The poorest results follow epiphyseal separations of the capitulum humeri, epicondylus medialis humeri upper and lower femur lower tibia, upper humerus lower radius and lower ulna.

In only two of the author's patients (with meta carpal and finger phalanx separations) was there enough shortening to produce a poor cosmetic effect and in only three (with lower femoral, capitulum, and median epicondyle separations) was there a deformity other than shortening which caused a poor cosmetic result.

Ireland states that although it might be expected that the greatest amount of shortening would occur in injuries to the epiphyses which unite last in all bones no conclusion could be drawn in regard to this matter from the observations made in the cases reviewed.

The amount of separation of the fragments as measured in the roentgenogram either before or after an attempt at alignment, is apparently of no value in the prognosis as to sequelae. The essential factor is undoubtedly the integrity of the epiphysis. At the present time there appear to be no evident criteria by which this can be determined.

H. EARLE CONWELL, M.D.

Ellison, E. L.: Pathological Fractures. *Surg. Gynec. & Obst.*, 1933 lvi, 504.

In 63 per cent of the author's cases of pathological fracture the cause of the fracture was a tumor in 13 per cent, an infection in 13.6 per cent, a nutritional disturbance and in 10.4 per cent miscellaneous conditions. Mentioned in order of decreasing frequency the tumors were carcinoma, sarcoma, cysts, myeloma, hypernephroma, and endothelioma. The infections were osteomyelitis, leuc, tuberculosis, sarcoid and Paget's disease. The conditions due to nutritional disturbances were osteogenesis imperfecta, rickets, scurvy and osteomalacia and the miscellaneous conditions were hyperparathyroidism, atrophy from various causes and poisons.

Pathological fractures occur most often in the long bones connected with the trunk. The bone most frequently involved is the femur.

In osteitis fibrosa cystica, fractures result in cure of the cysts. In cases of cysts due to parasites or chondromata the pathological tissue must be removed before healing will result. It is advisable to use roentgenotherapy after immobilization to insure proper eradication of the neoplastic tissue.

In cases of carcinoma the most common single cause of pathological fractures healing occurs be-

fore death from the disease in about 50 per cent of the cases. In sarcoma, endothelioma, and multiple myelomata, the pathological fractures rarely heal.

In fractures associated with acute osteomyelitis good results are obtained if proper drainage is established and the bone is immobilized early. Fractures due to syphilis of bone are rare but heal well under treatment. In fractures associated with tuberculosis of bone the results are poor. In Paget's disease union is slow. Non-union usually means sarcoma.

In neuropathic conditions the bone is fragile because of atrophy of disuse and neurotrophic changes. These conditions include tabes dorsalis, paresis, syringomyelia, spina bifida, infantile paralysis, and hemiplegia. The prognosis for union is good, but care must be used in immobilization, particularly in cases of hemiplegia, as persons with these conditions easily develop hypostatic pneumonia.

Fractures due to osteomalacia, rickets, and scurvy heal quickly under treatment with large amounts of Vitamins D and C.

Hyperparathyroidism which is due usually to a parathyroid adenoma, frequently causes multiple fractures. Removal of the tumor followed by the administration of viosterol and calcium gives good results.

Fractures associated with osteogenesis imperfecta and osteosclerosis generalisata heal well, but recur in Gaucher's disease, rarefaction of bone causes fractures which heal poorly.

Workers in industries engaged in the production of phosphorus, pearls, arsenic, pyrogallol acid, and mesothorium are subject to bone erosion and fracture. The prognosis is good as to union if the cause is removed, but is poor as to complications.

(ATKIN L. DALL, M.D.)

Colp, R., and Minge, S.: The Treatment of Joint Fractures. *A. N. Surg.* 1933 XLVII, 177

The authors state that fractures into joints are not as common as fractures of the long bones. They report on 154 cases of fracture involving joints exclusive of the spine which were treated during the surgical wards of the Beekman Street Hospital, New York, in the period from 1926 to 1930. The total number of fractures treated during that time was 2,250.

Joints adequately protected by large muscles, such as the hip and shoulder are less liable to injury than those guarded mainly by tendinous structures, such as the wrist and ankle. Joints of the lower extremity hampered by weight-bearing, are more prone to injury than those of the upper extremity, in which the conditional reflexes are quicker and more adept in protective movements and the range of evasive motion is increased by the great mobility of the shoulder joint. In joints such as the hip and knee the intra-articular ligaments have a stabilizing and immobilizing influence.

Intrinsic joint injury resulting in definite irregularity of the joint surface interferes with function.

Therefore every attempt should be made to establish normal alignment of the joint surface if the displacement warrants.

Reduction may be accomplished by manual manipulation under anesthesia, by the slower process of traction, or by open operation. In most joint fractures the displacement of fragments is not marked. While it is possible for exuberant callus to protrude into a joint cavity this complication did not occur in the cases reviewed. Moreover it has been definitely shown that synovial fluid acts as a deterrent to callus formation. Injury of extra-articular and periarticular tissues, which may result in fibrous connective tissue adhesions and contractions restricting the range of joint motion, is a serious complication, but may be prevented by treatment including the immediate application of radiant heat and gentle massage whenever feasible supplemented as soon as possible by early active motion within normal limits.

As a rule active motion need not be delayed because of the fear of increasing deformity as the original displacement of fragments is usually slight and is rarely made worse by manipulation. It is only in the exceptional case complicated by unusual comminution and marked separation of the fragments that the condition is aggravated by early motion. The danger of the production of arthritis by early motion is more theoretical than real unless there is an underlying arthritic tendency. Weight-bearing should be deferred until union is firm as the direct pressure may cause splaying of the bones making up the injured joint.

In some types of joint fractures immobilization is to be preferred to early motion. In fractures complicated by severe injury of ligamentous and capsular attachments resulting in dislocation, motion should be delayed until the ligamentous injuries are firmly healed. In such cases the application of traction to maintain the reduction may permit the institution of motion at an earlier period without the disturbance of fragments. Immobilization is preferable to active motion also in cases of artrodial joints as the constant slight play of the fragments in a relatively stable joint favors non-union, arthritis, and persistent pain.

Unusual joint fractures in which the fragments become so displaced that function is interfered with by malunion, non-union, or small fragments lying free in the joint are usually best treated by operative measures. The displaced fragments may be replaced and held by sutures or metal appliances. If the fragments are small they may be removed unless their removal will interfere with joint function or bone growth. Severe ligamentous damage resulting in the wide separation of bone fragments or marked subluxation of the joint may require immediate repair.

While these general principles form a basis for the treatment, they cannot be observed routinely. The treatment must be adapted to the physical findings in the particular case. H. EARLE CORWELL, M.D.

Rotolo, G: Fractures of the Clavicle (Le fratture della clavicola) *Chir. chir.*, 1932, VIII, 874

The author discusses the causes, symptoms, clinical and roentgen diagnosis, complications and treatment of fractures of the clavicle and reviews the results obtained in 343 cases. Most of the cases were treated by a modification of the method of Bardenheuer—continuous balanced suspension traction with the arm in abduction and supination. Closed reduction was done in all except a few in which it was impossible or where nerve or vascular injury was present. Good function was obtained. In a few cases a slight deformity or overriding persisted because of intolerance of the patient to the application of sufficient weight or because of delay of treatment. Good results were obtained even in cases of comminuted fractures.

Twenty-seven cases representative of the different types of fractures in the 343 cases reviewed are reported in detail with roentgenograms and the findings of the follow-up examination which was made from one month to four years after the treatment. Only 8 of these cases were treated by open reduction.

The author is convinced that open operation should be the exceptional type of treatment. He believes that the confinement to bed necessitated by the treatment described is compensated for by the results which are superior to those of other methods.

A. LOUIS ROSE, M.D.

Wilson, P. D. Fractures and Dislocations in the Region of the Elbow. *Surg., Gynec. & Obst.* 1933, LVI, 335

Of 4,536 skeletal injuries seen during a period of seven years about 10 per cent involved the elbow. In the cases of 140 patients with 176 elbow injuries, the end results after a year or more were carefully graded according to the system in use at the Massachusetts General Hospital, Boston. Arranged in order of decreasing frequency the most common injuries were dislocations, supracondylar fractures, fractures of the head and neck of the radius and fractures of the olecranon. In 5 per cent of the hospital cases there was a complicating injury of one of the main nerves of the arm.

Of 57 supracondylar (diacondylar) fractures, 3 were of the flexion type with anterior displacement of the distal fragment and the rest were of the common hyperextension type. These fractures were usually reduced successfully by the closed method. The menace of vascular interruption is ever present. In cases with severe circulatory disturbances attempts at reduction should be abandoned in favor of such measures as extension of the elbow, elevation of the arm, the application of heat and operative relief of tension. The fracture may be reduced later but excellent results are sometimes obtained without complete reduction.

Fracture of an epicondyle usually occurs on the medial side and is usually an epiphyseal separation. In simple cases the prognosis is good if the elbow

is treated in flexion. If the fragment is displaced into the elbow joint and there is involvement of the ulnar nerve, immediate operation is required. Excision is recommended.

Condylar fractures are largely individual problems. In cases of fracture of the medial condyle closed reduction should be followed by fixation in the position of acute flexion, and in cases of fracture of the lateral condyle, by fixation in complete extension. In cases of condylar fracture with severe deformity the choice of treatment lies between (1) open operation preferably with internal fixation of the major fragments by screws or a plate and (2) suspension and traction with early mobilization. Open reduction should be followed by early mobilization with traction and suspension.

Fracture of the capitellar epiphysis can be diagnosed by comparing lateral roentgenograms of the injured and sound arm. Slight displacement requires no treatment other than fixation in acute flexion for two or three weeks. When there is complete rotary displacement open reduction is necessary. Ununited fractures of the epiphysis are often followed by cubitus valgus with late ulnar nerve palsy.

The head and neck of the radius are fractured most frequently in adult life. Epiphyseal fractures with displacement require reduction by open operation. In the cases of adults, open reduction should be reserved for fractures of the neck. When two-thirds of the head, including the portion which articulates with the ulna, are intact displaced fragments should be excised. In all other comminuted and displaced fractures resection of the entire head should be done. Resection should be performed within the first two weeks, and care should be taken that no bone fragments are left behind.

Fractures of the olecranon without displacement may be splinted for three weeks with the arm in right-angle flexion. When there is only slight displacement complete extension may suffice but in cases of gross displacement open operation is desirable. As suture material living fascia is recommended. Active motion should be started after one week.

Dislocations of both bones at the elbow are complicated by fractures most often in the second decade and after the third decade of life. Whether such dislocations are complicated or not, immediate reduction preceded and followed by roentgen examination should be done under anesthesia. The menace of calcifying hematoma may be increased by repeated manipulations of the elbow. Forcible passive movements to increase extension are particularly dangerous. In cases of calcifying hematoma the early treatment should consist of complete rest. Excision should not be attempted before a year.

Fractures of the coronoid process and dislocations of the upper end of the radius are discussed briefly.

The article contains charts showing the age incidence and tables showing the age incidence, treat

ment, and end results of the different types of injury. Striking fractures and dislocations are shown by outline drawings. The author concludes that fractures and dislocations of the elbow are not formidable when they are understood and correctly treated.

WALTER P. BLOOM, M.D.

Lange, M.: The Danger of the Formation of Pseudarthrosis and of Necrosis of the Head of the Femur After Fracture of the Neck or Head of the Femur in Young Persons. Die Gefahr der Pseudarthrosebildung und Femurkopfnecrose nach Schenckelhals- und Schenckelkopfbrüchen jugendlicher Leute. *Archiv klin. Chir.* 1932, LVII, 531.

The theory that fracture of the neck of the femur shows a much more marked tendency to heal in children and young persons than in adults is erroneous. In lateral fractures of the neck of the femur there is great danger of the formation of pseudarthrosis, and in isolated fractures of the head of the femur there is great danger of aseptic necrosis.

From serial roentgenograms made in typical cases it appears that after lateral fractures of the neck of the femur in young persons between eleven and seventeen years of age aseptic necrosis of the upper end of the femur may develop very gradually after roentgenological and clinical healing of the fracture has taken place. The disease pictures show an agreement with Perthes' disease which, according to these observations occurs as a sequel to a traumatic vascular injury causing a disturbance of the nutrition of the head.

Isolated fracture of the head of the femur usually remains undiagnosed for a long time. The early symptoms subside, but after from three to six months the condition becomes worse again because of local necrosis in the capital epiphysis. Later the head appears flattened and shows a trough-shaped depression. Because of the danger of secondary necrosis of the head, apparatus to relieve weight bearing must be used for at least six months in cases of fracture of the neck of the femur even in the cases of young persons. EISENBERG (ZL).

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Roid, M. R.: A General Consideration of Blood Supply in the Practice of Medicine and Surgery. *South M. J.*, 1933 xvi, 107

A knowledge of the circulatory system is of prime importance in the practice of surgery. Infection of visceral spaces and of operative wounds is dependent largely upon foreign bodies and dead or devitalized tissue. Consequently it is important for the surgeon to handle the tissues delicately so that he will not crush them, to avoid mass ligation and the burial of more ligature material than is absolutely necessary, and to prevent tension that will interfere with blood supply.

The relief of embarrassment to the general circulation by use of the effect of gravity in Fowler's position is emphasized.

Non-specific measures of great importance in the treatment of peripheral vascular disease are discussed. Maximum coöperation is achieved by carefully explaining to the patient the rationale of the procedures used and checking their details repeatedly.

The level of the resting extremity which results in optimum circulation to the foot is determined individually for each case and then maintained as constantly as possible. Elevation much above this optimum level is a common mistake and favors the development of gangrene.

The cycle of position and exercises (Buerger and Allen) in which time is devoted to elevation, dependency with exercise, and rest with heat is a most important part of the routine of the patient's self help. They improve the circulation.

The skin should be carefully washed and oiled until it becomes as soft and delicate as possible. The involved extremities must be protected from cold, infection and trauma. The fluid intake should be established by actual measurement and maintained at a high level. In some cases thyroid extract may improve the circulation. All foci of infection should be eradicated. Tobacco should not be used.

These conservative measures often prevent the development of a threatened gangrene.

A constant endeavor to improve the blood supply will improve the results not only of surgeons, but also of physicians. W. J. MERRILL SCOTT, M.D.

Sheehan D.: On the Innervation of the Blood Vessels of the Upper Extremity: Some Anatomical Considerations. *Brit. J. Surg.*, 1933 xi, 412.

Sheehan calls attention to the discrepancy between the results of lumbar and cervicodorsal sympathectomy. He notes that in properly selected

cases lumbar ganglionectomy has consistently satisfactory effects upon the blood vessels of the lower limbs whereas cervicodorsal sympathectomy may be very uncertain in its effect on the vascular system of the arm. He tabulates the possible factors underlying the incomplete results of cervicodorsal sympathectomy as follows:

- 1 Failure to produce a total sympathetic denervation of the limb
- 2 Pathological changes in the peripheral vessels (i.e. a local fault)
- 3 Action of middle cervical and vertebral ganglia as reflex centers. This theory necessitates the postulation of afferent vascular nerves.
- 4 Extension of the periaxillary nervous plexus as far down as the hand.

By means of gross anatomical dissections on twenty five specimens a study was made of the sympathetic supply of the blood vessels of the upper limb. Particular attention was paid to the rami communicantes the brachial plexus, and the relationship of the nerve fibers to the subclavian artery.

The most striking feature of the cervicodorsal sympathetic system is the great complexity and variability of its components. For this reason ramisection is an uncertain operation. Complete denervation is best obtained by ganglionectomy. In this procedure it is essential to remove the inferior cervical ganglion and the upper two thoracic ganglia. For this purpose as well as to avoid injury to the superior intercostal artery or thoracic duct the posterior approach is preferable. The many variations in the arrangement of the cervicodorsal sympathetic system are described and illustrated.

HERMAN E. PEARSE, M.D.

Blavier L.: Oscillometry: An Interpretation of the Oscillogram (Oscilometrie interpretation de l'oscillogramme). *Rev. belge d. sc. méd.*, 1933 iv 559.

Blavier reports a study of oscillometric curves obtained under various conditions in the cases of normal persons. A very sensitive oscillograph which recorded delicate variations in pressure was used. The apparatus was of two types. The first consisted of a cuff connected by a 'Y' to a Pachon instrument and to a chamber communicating with a diaphragm-covered capsule which transmitted variations in pressure to a recording arm on a smoked drum. The second type of apparatus had a mercury manometer instead of the Pachon instrument. In the recording of high pressures the double cuff of Gallavardin was used. By means of these instruments much more detailed curves were obtained than can be obtained with the commercial apparatus.

The author's purpose was to interpret the curves. Various physical factors were found to have an influence on the result. The thickness of the tissues between the vessel and cuff influences the amplitude of the curve. Other factors to be considered are the amount of air blown into the cuff, the volume changes in the tissue compressed and the tissues proximal to the compression. The amplitude of the oscillometric index varies with the tightness of the cuff.

After eliminating extrinsic factors, the author concluded that the oscillometric curve yields waves of the following three types: (1) those due to variation in the volume of the artery from periodic respiratory motions (Traube-Hering curves), those of direct respiratory origin which occur at all compressions with the increase of pressure at inspiration and the decrease on expiration, and (3) those of cardiac origin, which vary inversely with the frequency of the heart beat.

HEDMAN E. FRANK, M.D.

Moore, R. M., Williams, J. H., and Singleton, A. O., Jr.: Vasoconstrictor Fibers: Periphoral Course As Revealed by a Roentgenographic Method. *Arch. Surg.* 1933, xlvii, 303.

The authors have made a comparative study of periarterial sympathectomy, sympathetic gangliectomy and peripheral nerve section by means of postoperative roentgenographic visualization of the arteries.

The experiments were carried out on cats. At intervals after the operative procedure upon the nerves on one side, the vascular tree of both limbs was visualized by roentgenograms made after the intra-aortic injection of sodium iodide. The results were judged by comparing the caliber of the vessels of both limbs.

The disadvantages of this method are stated as follows:

1. The quantity of sodium iodide used is so toxic that it invariably proves lethal.
2. It does not reveal absolute degrees of constriction or dilatation, showing only a relative change in caliber.
3. The injection of the sodium iodide is very painful, as evidenced by stimulation of the anesthetized animal.

The authors believe that a relative vascular dilatation occurred on the side on which the lumbar sympathetic chain was removed. In these experiments the splanchnic nerve on the side of the sympathectomy was cut and the opposite adrenal removed. The dilatation occurred immediately and persisted for as long as eleven weeks after the sympathectomy.

Similar comparisons were made of vascular injections made after section of the sciatic trunk just external to the greater sciatic foramen. Pronounced vasodilatation was thought to have occurred. The same result was observed in half the cases of femoral nerve section.

Mechanical periarterial sympathectomy of the femoral artery failed to cause a discernible difference in the appearance of the vascular tree.

This evidence is interpreted as additional confirmation of the view that vasoconstrictor fibers join the peripheral arteries at irregular intervals after having been conveyed distally in the somatic nerve.

HEDMAN E. FRANK, M.D.

Leriche, R., and Fontaine, R.: The Nature of Raynaud's Disease (Sur la nature de la maladie de Raynaud). *Presse med. Par.* 1932, xl 1921.

The authors discuss the three major hypotheses concerning the causation of Raynaud's disease viz. (1) that the condition is solely a vasomotor phenomenon (2) that it is due to a distant arteritis and (3) that it depends on a local fault in the arteriolar musculature. The evidence for each of these hypotheses obtained from the literature and from the authors' clinical investigations is presented.

Raynaud believed the attacks to be of vasomotor origin. At autopsy he found the injected arteries patent, with nothing in their caliber or form to indicate that the disease was caused by a mechanical obstruction. During the past forty years there have appeared in the literature a series of histological reports showing the constant occurrence of peripheral arteriolitis or atheromatosis in patients with Raynaud's disease. However, these arterial lesions were found after the disease had been present for many years or in patients with arteriosclerosis elsewhere as well as in digits involved by gangrene. Photomicrographs of an amputated finger showing extensive sclerosis of intima and obvious obstruction of the smaller vessels are presented.

The authors believe that the obliterating arteriolitis is the result rather than the cause of the repeated spasmodic attacks. Other evidence supports this hypothesis. A very complete autopsy performed in a typical case (Klöder 1930) revealed no trace of an obliterating arteritis. Clinical and oscillometric examinations repeated over several years show no sign of arterial obliteration. In one case arterial obliteration was ruled out also by arteriography. Even some digital arteries have been proved patent by Gaertner's tonometer. In addition, the efficacy of sympathetic section in the treatment constitutes evidence against mechanical occlusion. For these reasons it seems impossible to attribute true Raynaud's disease to organic injury of the peripheral arterioles.

However vasoconstrictive attacks followed by cyanosis (called by the authors "false Raynaud's syndromes") not infrequently occur early in arteritis and particularly in Buerger's disease. Often cases with such attacks are reported in the literature erroneously as cases of Raynaud's disease. The authors acknowledge the responsibility for this mistake in two cases reported by Beck, 1927. They believe that the production of painful attacks of ischemia followed by a phase of vasodilatation is due to irritation of the periarterial sympathetic

fibers by advance of the inflammatory reaction to the adventitia. In support of this hypothesis they cite the cessation of the vasoconstrictive attacks in certain cases after resection of the obliterated arterial segment. Reflex excitation of spasms can be produced also by extravascular factors, such as edema of the periarterial tissues associated with a cervical rib which does not touch the subclavian artery. In arteritis of medium-sized vessels vasoconstrictive attacks are frequently observed (for example, during the development of multiple femoral aneurysms). Misinterpretation of these cases can easily be avoided as the circulation is not normal between the attacks. Moreover the oscillometric index and its response to cold and hot baths are definitely diminished, whereas in true Raynaud's disease the oscillometric index is normal between attacks however longstanding the disease.

Oscillometric analysis throws new light on the nature of Raynaud's disease. In the normal subject the oscillometric curve during rest is about midway between the curve of decreased oscillation after a cold bath (0 degrees for ten minutes) and that of increased oscillation after a warm bath (40 degrees for ten minutes). In Raynaud's disease the resting curve and the response to heat are normal, but the cold bath causes an exaggerated constriction, and during an attack of ischemia the oscillometric index diminishes much more rapidly toward the distal end of the extremity. From these responses the authors conclude that in Raynaud's disease the vasoconstrictors are hypersensitive especially in the more peripheral vessels.

In arteritis the involvement of the arterial walls diminishes the ability of the artery to respond and all three oscillometric curves are very close together. An occasional paradoxical response to the hot bath by vasoconstriction is explained by stasis from capillary dilatation without associated arteriolar relaxation. Such a paradoxical reaction signifies a partial lesion of the arterioles.

The authors believe that a careful analysis of the mechanism of the attacks in Raynaud's disease supplies evidence of a peripheral system of autonomic vascular control. Some of the features appear to depend on the extrinsic vasomotor innervation, while others arise from this intrinsic system of abort reflex arcs limited to the vessel walls. The authors believe that the latter system is responsible for the vascular reactions and residual symptoms after sympathectomy. They conclude that Raynaud's disease is usually if not always, an essentially peripheral and arteriolar condition. Lewis considers the essential abnormality in Raynaud's disease to be a local fault in the smooth muscle of the peripheral vessels. Against this hypothesis are the absence of a histologically demonstrable change in the muscle and the usual improvement after operation.

The cause of the hypothesized vasoconstrictor hypertonus is not known. Lesions are sometimes found in the sympathetic ganglia excised in Raynaud's disease, but are not specific and are too in-

constant to be considered an important etiological factor. Oppel and Ochutne suggested an exaggerated production of epinephrin as the underlying cause, but in one of the authors' cases unilateral suprarenalectomy was not particularly effective.

A simple arteriolar spasm can produce the trophic disorders characteristic of Raynaud's disease. This has been shown experimentally by (1) the gangrene resulting from the arterial spasm of ergotism in animals and man, and (2) Todd's demonstration that ungual trophic changes may be caused by sleeping with the arm elevated above the head. Consequently in Raynaud's disease trophic disorders and even gangrene are not an indication of arteritis as they can be caused by a vasomotor disturbance and may completely disappear after sympathectomy.

Scleroderma is often accompanied by ischemic attacks resembling those of Raynaud's disease. It is not clear whether the vascular reactions in the two conditions are fundamentally the same, but it is often difficult to distinguish them clinically.

W. J. MERRILL SCOTT, M.D.

Allen, A. W. *Peripheral Arterial Diseases*. *Internal Clinical* 1933, 1, 162.

This article summarizes many practical details that are of great value in the recognition, differentiation, and treatment of the common types of peripheral arterial disease. The important characteristics of each type are summarized in a table.

The symptom which most commonly brings the patient to the physician is pain or discomfort. Often this is typical intermittent claudication. In the examination of patients with this symptom impairment of the peripheral pulsations, abnormal pallor on elevation of the limb and unusual rubor on dependency of the limb are important signs. A list of the observations which should be made in all cases of suspected peripheral vascular disorder is given and the routine treatment to be started during or after this study is described.

Arteriosclerosis is of two types, the senile type and the Monckeberg type. In the latter microscopic examination of the arteries shows a tremendous thickening of the middle coat. However it is often possible to suspect the Monckeberg type of arteriosclerosis clinically when the condition does not respond well to routine measures comes on early in life and shows definite thickening of the arteries with absence of pulsation.

Thrombo-angitis obliterans occurs principally in young males. As a rule, from five to ten years after the beginning of the symptoms following a trauma (mechanical injury, chilling or infection) pain in the extremity becomes constant and often is associated with ulceration. All treatment is directed toward the development of collateral circulation and the relief of pain. In addition to the routine conservative measures the following procedures may be beneficial: (1) Injections of non-specific foreign pro-

tein (never to be used in the cases of patients with arteriosclerosis) (2) blocking of the sympathetic nervous system (to be done only if the vasomotor index is not too much reduced) and (3) peripheral nerve block. Injection of the posterior tibial nerve with alcohol and crushing of the superficial and deep peroneal nerve and the sural nerve produces complete anesthesia in the foot with perfect comfort even when Dakin dressings are applied to ulcerated lesions and causes maximum vasodilatation. In many cases the ulcers will heal and the collateral circulation will be improved (average time three months) so that major amputation may be avoided.

In all cases of obliterative disease of the arteries the author gives the patient printed instructions regarding the care of the feet. These are reproduced. He states that in such cases modified Buerger exercises (diagram shown) accomplish more than any other one method of treatment. The tolerance for the elevated and dependent positions should be determined for each patient individually and the time adjusted as improvement occurs. The optimum circulation level in bed should also be determined for each patient.

Vasomotor imbalance is of the primary type (Raynaud's disease) or of the secondary type associated with traumatic lesions or certain general conditions. The author accepts the hypothesis of Raynaud that the mechanism of the primary type is a central one. He states that the ability of the vessels to dilate should be tested by temporary inhibition of vasoconstriction. Removal of the sympathetic ganglia has given good results which, in the case of the lower extremity, have lasted as long as four years. However in fourteen of twenty four cases followed for over a year some vasomotor control recurred in the upper extremity. Alcohol injection of the sympathetic rami as a substitute for operation is discussed. It may cause a peripheral neuritis with very severe pain. Neither operative removal of the ganglia nor alcohol injection of the sympathetic rami should be considered unless the patient is incapacitated. Many patients with vasomotor imbalance, particularly of the primary type, receive considerable benefit, temporary or permanent, from hypercooling repeated daily.

W J MEXLER SCOTT M.D.

Conner L. A.: A Discussion of the Role of Arterial Thrombosis in the Visceral Diseases of Middle Life, Based upon Analogies Drawn from Coronary Thrombosis. *Am J M Sc.*, 1935 cxciv 13.

Attention is called to the fact that whereas thrombosis in the arteries of the heart and of the brain is known to be common and is easy to recognize clinically almost nothing is known regarding the symptoms of arterial thrombosis in the abdominal viscera. Nevertheless, the frequent occurrence of degenerative changes in the arteries of the pancreas, kidneys, spleen, and mesentery indicates that thrombosis in these vessels cannot be rare.

Failure to recognize attacks of arterial thrombosis in the abdominal organs must be due in part to the

inherent difficulties of diagnosis, but is almost certainly due in part also to failure to bear the possibility of such attacks in mind and to have accumulated pertinent evidence.

The author has made an attempt to construct a framework of diagnosis for arterial thrombosis in the kidney, pancreas, spleen and mesentery by utilizing certain symptoms associated with thrombotic infarction in the heart (fever, leucocytosis) and symptoms resulting from infarction due to embolism in the kidney, spleen, and mesentery.

Kidney. In a person of arteriosclerotic age in whom there is no reason to expect the discharge of arterial emboli, the presence of dull pain and tenderness in the flank of more or less fever, of a leucocytosis, and of red cells and albumin in the urine (if absent previously) would seem to justify a diagnosis of arterial thrombosis.

Spleen. Pain of the pleural type, fever, leucocytosis, tenderness and perhaps muscular rigidity in the splenic region and a to-and-fro peristaltic friction rub over some part of the splenic area make a sufficiently distinctive picture to warrant the diagnosis of arterial thrombosis if there is nothing to justify the suspicion of embolic infarction and if other satisfactory explanations of the symptoms are lacking.

Pancreas. In arterial thrombosis of the pancreas, one would expect to find pain of greater or lesser severity in the epigastric or umbilical regions with tenderness, some degree of shock, fever and leucocytosis, and probably nausea and vomiting. All of these symptoms might well be evoked by disturbances in various other organs in the neighborhood, but if in a person of appropriate age, they are associated with the appearance of sugar in the urine, this fact will go far toward justifying the diagnosis of arterial thrombosis.

Mesentery. It is to be expected that the symptoms of intestinal infarction, from whatever cause, will show great variations in character and severity depending upon the size and the location of the area of gut involved. The clinical picture is usually divided into two stages, the first characterized by symptoms due to irritation of the gut, and the second by paralysis. The onset is accompanied by violent crampy pain, nausea, and vomiting, sometimes by diarrhea, and usually by prostration, collapse, and sweating. The vomitus is often blood stained, and the stools frequently contain blood. After a day or two and often after temporary cessation of the severe pain, the symptoms of paralytic ileus appear—complete obstruction, great distention, persistent vomiting, pain, and tenderness. The temperature is usually elevated, but may be normal or subnormal. It seems probable that some degree of fever and leucocytosis must be present in every case at some stage. Even if the diagnosis of intestinal infarction seems justified, there is still the problem of distinguishing between the three possible causes—mesenteric venous thrombosis, arterial embolism and arterial thrombosis. If it is

possible to exclude the usual sources of an arterial embolus and conditions in the abdomen which predispose to thrombosis in the branches of the portal vein (appendicitis and other severe intestinal inflammations, hepatic cirrhosis, thrombosis of the portal vein) and if the patient is of middle age there is strong evidence that the infarction is the result of arterial thrombosis.

In conclusion the author says that when both internists and pathologists seek evidences of such thromboses and correlate their findings, the difficulties of diagnosis will probably be found not insurmountable and the clinical pictures will gradually emerge from their present obscurity as in the case of coronary thrombosis. **SAMUEL KAHN M.D.**

Albert, F.: Arterial Obliterations. A Physio-pathological Study (Les obliterations artérielles. Etude physiopathologique) Lyon chir 1932 xxix 649

In studies previously reported the author found that an active peripheral vasoconstriction follows ligation of the principal vein of an extremity causing a definite increase in the pressure in the corresponding peripheral arterial system. In subsequent studies he has found that total obliteration of the principal artery of an extremity brings about an active peripheral vasodilatation which considerably increases the effect of the vascular occlusion. Therefore, by reason of the active vasoconstriction it causes ligation of the principal vein should partially compensate for the vasodilatation following ligation of the artery.

From experiments in which an attempt was made to determine the mechanism of the active vasodilatation following obliteration of a major artery the conclusion was drawn that the vasomotor response does not depend upon the cerebrospinal reflexes or the long sympathetic reflexes. In a comparison of the findings of these studies with those of similar studies carried out by Krogh and Lewis, it appeared that the vasomotor reaction is due largely to the physicochemical modifications of the composition of the blood in the periphery and of the interstitial fluids of the affected parts caused by the disturbance of cellular metabolism brought about by the arterial obliteration. The author believes that, as a result of such a disturbance of metabolism, specific substances are produced or accumulated in the peripheral part of the extremity, and that these substances act directly upon the walls of the small arteries and capillaries and provoke the vasomotor reaction. When the ultra filtrate of blood recovered from an extremity showing marked peripheral vasomotor disturbances was injected into an animal, a marked peripheral vasodilatation occurred immediately. These substances were found to vary with the different forms of vascular disturbances.

In the treatment of certain vascular diseases the author has obtained very good results by simply compressing the artery at the root of the extremity.

In conclusion Albert says that the existence of such specific vasomotor substances must first be proved by carefully controlled experimental work, and then the nature of the substances must be studied before we can discuss their use in the treatment of peripheral vascular disturbances.

MONT R. REED M.D.

Pupini, G.: Anticoagulants and Vascular Suture (Anticoagulanti e suture vasale) Arch ital di chir 1932 xxxii, 661

Pupini reports a series of experiments to determine the effect of the local and systemic use of anti-coagulants in the prevention of thrombosis following the suture of arteries and veins. He found that suture material impregnated with sodium citrate and arsenobenzol did not give as satisfactory results as paraffinated suture material. Because of inactivation of the acids and the physical change in the suture material, impregnation with melaninic acid failed to prevent thrombosis.

The local use of sodium citrate in dilute concentration did not seem to injure the tissues, but was insufficient to prevent local postoperative thrombosis. The calcium salts removed by the citrate were soon replaced through the circulation. Slightly hypertonic solutions of sodium citrate were found of value to wash out the blood vessels before the application of other anticoagulants especially hirudin.

The local application of melaninic acid to the interior or exterior of the vessels in the form of a liquid or a paste at first appeared to give good results but later because of changes in the intima and media it retarded the healing processes and favored secondary hemorrhage, especially when the sutures were under tension.

Arsenobenzol was inferior to melaninic acid in the prevention of coagulation but had about the same toxic effect. The author concludes that these two substances have no place in vascular surgery.

The local use of a dilute solution of hirudin did not cause any damage to the tissues and its local effect was probably sufficiently prolonged to permit the repair of small wounds of the vessels.

The systemic use of hirudin to produce an artificial hemophilia was well tolerated by the animals even over a prolonged period of time and did not seem to disturb the clotting of the wound. The best results were obtained by this procedure. The increase in the bleeding from the wound made to gain access to the vessels was controlled by the local use of hemostatics.

PETER A. ROSE, M.D.

Pupini, G.: An Experimental Study of the Technique of Angiorrhaphy (Contributo sperimentale alla tecnica della sutura vasale) Clin chir 1932 viii, 1263

Pupini first presents a critical review of the various methods of vascular suture. The main obstacles to success are thrombosis near the line of suture and infection. Since injury to the vascular coats facilitates coagulation of the blood, continuity of the

lumen of the vessel must be preserved to prevent stasis and the suturing must be done with minimal trauma.

In 338 cases reviewed by Sofoteroff the procedures and results were as follows

Suture method	Cases	Thrombosis %	Permeability %
Murphy	90	56.61	17.69
Payr	86	72.76	27.33
Carrel	35	49.64	24.96

The author experimented on dogs, the blood of which coagulates much more readily than the blood of man. In order to test his method of suture under the most unfavorable conditions possible, he disregarded the age and weight of the animals and sutured the femoral artery a vessel which is small (from 1 to 4 mm. in diameter) under tension, and located in an area where maintenance of asepsis is difficult. His technique was as follows:

Under morphine-ether anesthesia and after preparation of the skin with iodine, Scarpa's triangle was bisected by a vertical incision from 12 to 15 cm. long. The femoral artery was then identified and by careful dissection with a fine bistoury was isolated for a distance of from 8 to 10 cm. Small arterial branches were tied and cut. Angiostats were applied and the artery was isolated from the adjacent structures by packing it off with small strips of gauze soaked in sterile paraffin or a mixture of oil and paraffin. The field of operation was kept absolutely dry. The adventitia in the field of the incision into the vessel was removed by the technique of Horsley. The stumps were then washed by means of a syringe containing a sterile solution of 1 per cent sodium chloride and 3 per cent sodium citrate. After this washing the field was carefully dried.

The suture material was No. 700 linen thread saturated with paraffin with a low melting point or white vaseline. Pupini regards this as superior to fine silk or horsehair. After suture of the vessel the field was again washed, the angiostats and the gauze packing were removed, the incision was closed in layers, the skin was again painted with iodine and sterile dressings were applied.

Pupini has perfected a special needle holder as improvement on his former instrument, which facilitates suturing with fine needles under direct vision. The vessel is held in a 3-bladed angiostat, which gives perfect apposition of the intima. The suturing is done with a doubled thread on one end of which is the needle and on the other end of which is a small weight by which the suture is laced across the vessel, a procedure giving perfect hemostasis. Summarized briefly Pupini's technique consists in temporary hemostasis by means of rubber bands, removal of the adventitia in the area to be sutured, flushing of the operative field, the application of 3-branched forceps to the ends of the vessels and continuous suture with the needle holder described.

The author has developed also 3 holders which hold the cut edges in apposition and under the correct tension and are of great value when an operation must be done without a well trained assistant. To prevent secondary hemorrhage he re-inforces the suture line by covering it with a flap of vein. In his experiments on dogs he obtained completely successful results from longitudinal suture. He believes that there is no advantage in closing small defects in the vessel wall by transverse suture that such defects are better closed by the patching method of Carrel. He disapproves of circular suture because of its technical difficulties and the danger of infection.

EDWARD T. LEECH, M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

McLean A J: Characteristics of Adequate Electro-surgical Current. *Am J Surg* 1933 xviii, 417

McLean says that electrosurgery has reached its present stage of development almost entirely by an empiricism balancing between manufacturing ability on the one hand and clinical skepticism and daring on the other.

Endothermy utilizes the production of intense local heat within the tissues. The intensity varies with the current density. If the intensity is less than destructive, the current is called diathermic. In order to prevent all except heating effects, high-frequency currents are used. Modern electrothermic devices employing frequencies of from 80,000 to 4,000,000 make it possible to pass large amounts of electrical energy through the body with only heating effects. At present this is the sole value of high frequency current as such. Contrary to general belief cutting and coagulation have no fundamental bearing on frequency oscillations, or wave form.

The effect of heat is dependent upon the intensity of the heat and this in turn is dependent on current density. A proper volume of current passing through the body between large (8 sq in. for example) electrodes is of low density mildly warming, and not destructive. The same volume of current passed between a large and a small ($\frac{1}{4}$ in. for example) electrode produces a higher density with coagulation of the tissues at the smaller electrode. The use of a needle electrode causes intense local destruction of tissue analogous to a clean surgical incision.

The author reports on an experimental electrosurgical unit and some commercial machines as to output and the histological character of tissue incisions.

An ideal machine should furnish from 250 to 300 ma. delivered at the electrode tip, most of which should be electively utilizable at below 200 volts. The current should be free from harmonic faradic effects and its frequency should be such that conduction delivery by clinically adequate cables is possible and uninvolved clamps and retractors in the operative field do not become warm. All parts of its circuit should be grounded through supply wiring. With many of the triode machines on the market today it is difficult to obtain adequate amperage without excessive voltage, and many gap machines supplying adequate amperage also possess unusual dial possibilities of redundant voltage.

In conclusion the author says that present cartel prices of most machines are excessive and those of several of the pioneer machines remain prohibitive.

GEORGE A. COLLIER M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

Knjazev E.: Electrical Injuries at the Tractor Factory at Celjabinsk (Elektrische Verletzungen auf der Traktorfabrik in Celjabinsk) *Nov ch Arkh* 1933 xxv 167

With the more extensive use of electricity in industry and private life, injuries from this source are observed with increasing frequency. Nevertheless, several questions with regard to the pathology and treatment of such injuries still remain practically uninvestigated. On the basis of two cases of severe electrical injuries the author discusses some of the aspects of these interesting and little understood traumata.

Electrical skin marks stand out in the normal skin. They are entirely painless and show no evidence of inflammation or eschar formation. They persist for a time and are then cast off. If a volt arch is added to the effect of the current, the skin marks are associated with burning. After severe injuries, not only the electrical marks but also the adjacent tissue, which otherwise appears entirely normal, undergo disintegration so that the initial necrotic portion shows a very pronounced tendency to spread. In one of the author's cases the area which at first measured 8 by 10 cm. increased until it measured 15 by 17 cm. and involved the greater part of the occiput. The hair showed a very peculiar change it was not singed, but was twisted in corkscrew fashion. The blood vessels became brittle and bled intensively. The bones also suffer trophic changes large portions such as entire digits sometimes being cast off without pain or suppuration. Disturbances of the central nervous system and peripheral nerve trunks are manifested by edema and hemorrhage of the brain, epileptiform attacks, neuritis, and paralysis of the extremities.

With regard to the danger to life the author says that even low tension currents (up to 60 volts) may prove fatal. Occasionally apparent death (lethargia electrica) may occur. As a striking example the author cites the case of an engineer who remained for forty-eight hours without signs of life following an injury from a high-tension current. He had been laid out in a funeral parlor and got up by himself and returned to his relatives. The only definite signs of death are death-spots. Unconsciousness and cessation of the cardiac and respiratory activities are not absolute signs of death in electrical injuries. As a rule no specific changes are found at the autopsy on persons who have died from electrical trauma.

Artificial respiration, possibly by means of apparatus especially constructed for the purpose,

should be begun immediately after the injury. The treatment should be strictly conservative. There should be no operative wound toilet and no amputations. For the relief of edema of the brain lumbar puncture is indicated.

The author's own material consists of two cases of severe electrical injuries. The first patient was killed by a current of 100 volts. The second recovered from a current of 22,000 volts although he was severely injured. G. ABRON (Z)

ANÆSTHESIA

Woodbridge, P. D.: Better Gas Anæsthesia. The Carbon Dioxide Absorption Method. *New England J. Med.*, 1933, cviii, 633

With the usual method of administering anæsthetic gases such as nitrous oxide or ethylene with or without ether a continuous or intermittent flow of the gas mixed with oxygen is supplied throughout the course of the anæsthesia. The oxygen serves to support life and to dilute the anæsthetic gas. The diluting might well be done with any inert gas.

While it is often thought that the amount of re-breathing is controlled by the size of the aperture in the escape valve, re-breathing depends rather on the volume of flow of gas from the machine to the reservoir. If this flow is as great as the respiratory volume, there will be practically no re-breathing, but if the minute volume flow from the machine is half the minute respiratory volume, half of each inhalation will be re-breathed gas.

The question arises: How rapidly shall gas be made to flow into the reservoir? With the degrees of fractional re-breathing ordinarily used, the cost of the gases varies from \$1.50 to \$5.00 per hour. Occasionally anæsthetists employ complete re-breathing for a few minutes for the sake of economy. This is done by closing the escape valve and stopping the flow of gases from the machine. During this time the patient gradually exhausts the supply of oxygen in the re-breathed mixture and replaces it with carbon dioxide. The anæsthesia is not lightened because the anæsthetic gas (nitrous oxide or ethylene) in the reservoir remains in equilibrium with that in the blood, but anoxæmia and hyperpnoea gradually increase.

The flow of gas from the machine must be fast enough to prevent depletion of oxygen and undue accumulation of carbon dioxide in the reservoir. The sole function of the additional anæsthetic gas supplied throughout the period of anæsthesia is to flush the accumulating carbon dioxide out of the reservoir. A constant flow of nitrous oxide or ethylene is not needed.

When the respiratory volume is 15 liters, the cost of flushing out the carbon dioxide with 90 per cent nitrous oxide and 10 per cent oxygen is \$1.50 per hour if half re-breathing is used and \$3.60 if no re-breathing is used.

The carbon dioxide can be removed much more cheaply by chemical means. Fifty cents worth of

soda lime (sodium and calcium hydrate) will absorb the carbon dioxide produced during six to ten hours of anæsthesia. To the 9 cents or less per hour which the soda lime costs should be added from 8 to 15 cents for the oxygen required for the body. Therefore when there is no leak in the apparatus or beneath the mask, the maximum cost per hour for maintenance of anæsthesia is 24 cents.

Woodbridge describes two types of apparatus by which these principles may be applied. A soda-lime container is placed in the system. In the apparatus of the first type the Waters apparatus, called the to-and-fro apparatus, the gases are passed to the bag and back through the same tube, thus passing through the soda-lime twice. In the apparatus of the second type described by Foregger and by Sword and called the circuit apparatus or closed circle apparatus, the gases pass through the soda lime only on expiration. The relative merits of the two types of apparatus are discussed.

Some of the advantages of the carbon dioxide absorption method may be summarized as follows:

1. The breathing is usually very quiet.
2. The conservation of heat has been roughly estimated to amount to 25 calories per minute in the warming of the gases and to from 150 to 200 calories in the evaporation of the water to moisten the gases.
3. The removal of carbon dioxide from anæsthetic mixtures seems to allow the use of a higher percentage of oxygen.
4. Vomiting after thyroid operations is reduced.
5. The explosion hazard is reduced.

WILLARD J. KIRBY, M.D.

Ashworth, H. K.: Nervous Sequelæ of Spinal Anæsthesia. *Proc. Roy. Soc. Med. Lond.*, 1933, xxvi, 50

The author discusses the immediate, remote, and late effects of spinal anæsthesia in a series of 650 cases. Among the immediate effects he lists paralysis of the phrenic nerves and failure of the respiratory system. These are due to error in the technique or dosage or the nature of the drug used.

The remote effects include meningitis, paresis with analgesia, headache, mental changes and back ache.

Meningitis due to a non-hæmolytic streptococcus of low virulence occurred in 1 of the cases reviewed and caused death seven weeks after the operation.

Paresis and analgesia occurred in 3 cases. In 1 there was sixth-nerve palsy of eight weeks duration, and in 1, paresis of the legs of eighteen days duration which was associated with headache and retention of urine. In the third case difficulty was experienced in the administration of the anæsthetic and the patient developed cramps and stiffness of the legs. Five hours after the operation, vomiting of "coffee-ground" vomitus occurred. Twenty-four hours after the operation there was complete paralysis of the spinal cord below the ninth dorsal vertebra. Later this extended upward and death resulted following circulatory collapse.

Headache was the most frequent remote complication and most difficult to treat. It occurred in 4.0 per cent of 134 cases in which percaline was used and in a slightly smaller percentage of those in which stovaine or spinocaine was employed. When it is of the frontal type it is due to seepage of spinal fluid at the site of the puncture and should be treated by placing the patient in the Trendelenburg position and administering phenacetin and aspirin. When it is of the occipital type and accompanied by signs of meningismus it is due to over-secretion of spinal fluid from a disturbance of the choroid plexus and should be treated by the administration of pituitrin, the use of a hypertonic solution or repeated spinal puncture.

Mental changes resulting in maniacal delirium occurred in 1 of the cases reviewed. The patient died. The surgeon is convinced that this patient had delirium tremens.

Backache is due to the needle puncture and is of little importance.

To determine the late effects of spinal anesthesia the author sent to 272 patients a questionnaire regarding the occurrence of headache, eyesight trouble, tingling and weakness of the legs, and loss of control of the bladder or bowels. Two hundred and two of the patients replied. Forty-one had died. Ninety-seven were well. Of the 64 others 30 were re-examined by a neurologist. Seven of the 30 had symptoms which appeared to have been caused or aggravated by the spinal anesthetic. Three had indefinite cerebrovascular degeneration. Two had unilateral deafness. One had occipital headache, tenderness of the scalp, and reduced ankle jerk on one side. One, who had had a hemiplegia with infection of the wound complained of headache, falling eyesight and paresthesia of the right leg but these symptoms were due partly to a functional neurosis.

Of the 272 cases, spinocaine was used in 148, stovaine in 65, percaline in 34, durocaine in 18, planocaine in 6 and procaine in 1. The author found no difference between these drugs as regards the incidence of sequelae.

G DANIEL DELFRAY M.D.

Cazzamalli P: Tissue Reactions and Local Anesthetics (Reazioni tissutari ed anestesia locale) *Chirurgia*, 1935 VIII, 1123.

Cazzamalli reports experiments on guinea pigs in which he determined histologically the reaction of the tissues to infiltration with normal sodium chloride solution, a 1 per cent solution of novocain alone, and a 1 per cent solution of novocain with about 0.0004 per cent adrenalin which is equivalent to 1 drop of adrenalin to each cubic centimeter of the novocain solution. One series of experiments was carried out on normal animals and another on animals in which septicemia had been produced by the intracardiac injection of staphylococcus aureus.

He observed that local anesthesia produced by the infiltration of novocain caused tissue reactions



Fig 1 Twelve hours after infiltration with novocain. The inflammatory infiltration in the edematous tissue spaces is pronounced and in some places stimulates aseptic inflammation. A fibrinoid reticulum is evident.

which varied in degree and gravity according to whether or not adrenalin had been added to the solution. Infiltration with novocain alone was followed by marked vasodilatation, capillary congestion, and in places, moderate interstitial hemorrhages. These changes began close to the end of the anesthetic effect of the novocain solution and continued for about three days. Resolution occurred with the formation of a small amount of connective tissue (Fig 1).



Fig 2 Three days after infiltration with novocain and adrenalin. Abundant granulation tissue in the areas of infiltration and the characteristic accumulations of mobile elements around necrotic fibers are noted.

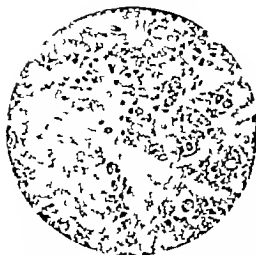


Fig. 3 Seven days after infiltration with novocain and adrenalin. Atrophic muscular fibers in the process of disappearing. Granulation tissue abundant. Large areas of newly formed adult connective tissue.

Infiltration with novocain and adrenalin, besides producing the vasodilatation and exudation observed following the use of novocain alone, caused large interstitial hemorrhages and diffuse tissue necrosis. The tissue changes occurring in the process of repair of the destroyed tissue were observed (Figs. 2 and 3). The author attributes this toxic effect on the tissues to the adrenalin and advises against the use of adrenalin in local anesthesia.

Infiltration of novocain or of novocain and adrenalin in the presence of a staphylococemia did not predispose to localization of the infection at the site of the injection. PRINZ A. ROSE, M.D.

Seeger T: Deaths from Local Anesthesia Induced with Novocain (Ueber Todesfälle durch örtliche Betäubung mit Novocain) *Arch. Obit. u. Heilk.* 1932 cxxvii, 49.

Novocain poisoning from the local use of novocain is of great interest also to the eye specialist. The author reports a case in which death followed the in-

jection of from 12 to 15 c.cm. of a $\frac{1}{2}$ per cent solution of novocain and a case in which it followed the injection of from 50 to 52 c.cm. of a 1 per cent solution of novocain to which a small amount of suprarenin had been added. In the first case it occurred while the patient was being prepared for tonsillectomy and in the second case at the beginning of a plastic operation on the larynx. In the first case autopsy disclosed a lipomatosis of the heart, a thymus gland weighing 20 gm. and swelling of all lymphatic glands, but especially of those of the neck. In the second case there was a slight lipomatosis, which was quite surprising because seven months previously the patient had withstood a serious operation performed under local anesthesia induced with a much larger quantity of novocain.

The literature reports sixty-four cases of death due to novocain. In twenty-three the anesthesia was induced for tonsillectomy. An analysis of all of the published reports indicates that in the majority of the cases the presence of status thymicolymphaticus was assumed. On the basis of careful observation and a general consideration of facts the author rejects this theory as well as the explanation that the deaths were caused by an accidental intravascular injection. The theory that suprarenin was responsible is also unsatisfactory. In most of the cases the amount of novocain used was under 0.1 gm., which is far below the toxic dose. Therefore general poisoning by the novocain is ruled out.

Grouping of the cases according to the part affected shows that the throat was involved in thirty-four. It is well known that even a relatively slight mechanical injury especially of the throat, can cause sudden death by the reflex route. In this connection the author cites the investigations of Hering on the "sinus caroticus reflex." Any irritation of the sinus caroticus may cause cardiac flutter and death from heart failure.

Seeger concludes that the reported deaths occurring during anesthesia of the throat were caused, not by novocain poisoning but by a disturbance of the sinus caroticus reflex. However similar shock-like effects, originating in the pleura or the dura may occur in the splanchnic region. The basis for individual variations in certain reflex mechanisms has not yet been determined. LOWENSTERN (C)

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Epifanio, G., and Cola, G: An Experimental Study of Irradiation of the Hypophysis (*Ricerche sperimentali sull'irradiazione dell'Ipofisi*) *Radiol. med.*, 1932 xix, 235S.

In experiments on rabbits a study of the function of the hypophysis was made by irradiating the gland with the roentgen rays. Rather hard rays were used—180 kv 2 ma.—and a copper and aluminum filter.

It was found that complete suppression of the function of the hypophysis caused death. All of the animals irradiated with large doses died in from seven to twenty-eight days. They showed loss of weight, cachexia, anorexia, loss of sexual function, apathy, somnolence, and terminal convulsions. There may have been a general toxic action associated with the loss of function of the hypophysis, but the changes found at autopsy differed markedly from those found in animals given general irradiation with large doses. Animals which had been castrated survived even intense irradiation although they showed signs of great suffering.

The experiments demonstrated that the hypophysis has a very important effect on bone growth and sex function. The changes in the sexual organs consisted essentially of atrophy of the testicles, uterus, and ovaries, and weakening or abolition of sexual function. In young rabbits, irradiation of the hypophysis caused arrest of development of the genital organs. In castrated rabbits, it abolished the sexual activity which had been preserved after castration.

In young rabbits, irradiation of the hypophysis with small doses caused increased bone growth and in adult rabbits was often followed by hypercalcification of the bones and disappearance of the epiphyseal cartilages. In both adult and growing rabbits it caused slight enlargement of the epiphyses of long bones. Following irradiation with large doses there were serious changes in the bones resembling those of human rickets.

Also after irradiation with large doses there was atrophy or disappearance of the thymus and thyroid, whereas after irradiation with small doses these glands increased in size. The effect on the suprarenals was just the opposite. The other endocrine glands were not affected.

The anterior lobe of the hypophysis was most sensitive to the rays, the intermediate part less sensitive and the posterior lobe least sensitive. Of the cells, the acidophile cells were the most sensitive. The fact that none of the animals showed polyuria, glycosuria, adiposity or bullimia confirms the opinion of those who attribute these changes to

lesions of the nerve centers of the hypothalamic region.

The dose required to destroy the hypophysis was from 90 to 120 per cent of an erythema dose and the stimulating dose varied from 15 to 25 per cent of an erythema dose. AUDREY GOSA MORGAN M.D.

Pohle, E. A. and Ritchie, G: Studies of the Effect of Roentgen Rays on the Healing of Wounds. II Histological Changes in Skin Wounds in Rats Following Postoperative Irradiation. *Radiology* 1933 xi, 103.

In a previous communication the authors reported the results of experiments to determine the behavior of skin wounds in rats under pre-operative and postoperative irradiation. It was found that exposure to a dose of 1,000 r given at one time from one to thirty days before the incision did not influence the healing process perceptibly. Similar doses given immediately twenty-four hours and forty-eight hours, respectively after the incision retarded the healing process, but did not interfere with the final formation of a smooth scar. The retardation was most constant in the animals irradiated after twenty-four hours. The histological findings were recorded only seven days after the cutting or after complete healing of the wounds. The experiments reported in this article were carried out to investigate the histological changes further by examining specimens taken at intervals of from one to nine days after the incision.

The technique used and the results obtained are recorded in detail. Microscopic examination of the wounds revealed that whereas in an unirradiated incision active repair began very soon after the cutting and definite fibroblast formation could be noted by the end of forty-eight hours at the latest in a treated incision there was a definite retardation of this process. The edges of the wound appeared inactive and sluggish. Fibroblasts, if noted at all, were seen relatively late and in reduced numbers. In addition, there was distinct irregularity of growth and the newly formed cells tended to be atypical. The delay in healing which in the previous experiments, was observed most constantly in wounds treated twenty-four hours after cutting was again noted. It became evident histologically from three to four days after the cutting but seemed most apparent about seven or eight days following incision. The irradiation seemed to have less effect on the epithelium than on the underlying connective tissue. This fact may account for some of the difference of opinion regarding clinical results. In many cases the upper layers of the connective tissue suffered most so that there was active connective tissue proliferation in the deeper part of a

wound while the superficial parts still showed a well-marked inactivity. Distinct variations in reaction were noted in different animals.

ADOLPH HARTUNG, M.D.

RADIUM

Cutler, M.: Radiation Therapy of Cancer of the Skin. *Am J Roentgenol* 193 xxvii, 734.

Cancers of the skin constitute a group of neoplasms which are suitable for irradiation therapy as they are radiosensitive and readily accessible to irradiation. A common error in their treatment is inadequate exposure resulting in incomplete destruction and the establishment of radio-immunity. It is very important to give a complete sterilizing dose at the first irradiation. Basal-cell and squamous-cell lesions constitute the majority of skin carcinomata. A special variety of basal-cell lesions is the adenoid-cystic epithelioma. The author considers radium irradiation the method of choice in the treatment of skin malignancies, and limits his discussion to this method.

In order to destroy a radiosensitive tumor adequate dosage of gamma irradiation correctly applied should be prolonged over several days. A radiosensitive tumor is defined as one with cells which may be completely destroyed by irradiation with out permanent damage of the tumor bed. Prolongation of the irradiation is extremely important in the treatment of squamous-cell carcinoma and of less importance in the treatment of basal-cell forms. Homogeneous distribution of irradiation is another requisite for success. Elaborate and detailed studies and the construction of curves indicating the quantity of irradiation have been worked out by Mifordoch and Simon at the University of Brussels. Though

the irradiation should be prolonged, there is an optimum time interval beyond which it should not extend. According to the French school, the treatment of cancer of the skin and of the mucous membrane of the tongue should be accomplished in from five to seven days.

The radium is applied with fixed plaques or moulded applicators. When irregular surfaces are involved, the moulded applicators seem to yield the best results. At any rate, accuracy of application and distribution of the irradiation are of extreme importance. In cases of cancer of the skin which has been previously irradiated treatment is difficult. Estimation of the necessary dosage is impossible. Some leading clinics refuse to irradiate such lesions further. Surgery or electrocoagulation seems to be preferable. In some cases Cutler has treated post irradiation recurrences successfully with removal platinum radium containers.

Of four lesions of the eyelids, the author eradicated three by means of plastic moulds. The fourth recurred and was treated surgically. For intractable ulcers or so-called roentgen and radium burns, Cutler recommends wide surgical excision with plastic repair. Keratosis produced by repeated radium or roentgen exposures often respond to surface applications. Carcinoma of the lip if in a fairly early stage is treated with a moulded radium applicator permitting exposure on three sides. The dosage used is 0.7 mc destroyed (93 mgm. hr.) per square centimeter with filtration by 1.0 mm. of platinum. Small lesions may be irradiated in a few hours, but from ten to fifteen hour exposures are preferable. In the treatment of the submental and submaxillary glands, intensive irradiation is in general as effective as surgical removal.

A. JAMES LARKIN M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Lyon, E.: Primary Congenital Disturbances of Lipoid Metabolism and the Vertebral Column (Primäre angeborene Lipidstoffwechselstörungen und Wirbelsäule) *Arch. f. orthop. Chir.* 1932 xxxii, 341

The origin of the disturbances discussed is unknown. There are three forms (1) the phosphatid cell lipomatosis of the Niemann-Pick type characterized by leathiness, which usually ends fatally in the first or second year of life (2) the cerebroside-cell (cerebroside-cell hepatosplenomegaly) lipoidosis of the Gaucher type characterized by the presence of cerebroside keratin and (3) the cholesterol-cell lipoidosis of the Schueller-Christian type, characterized by cholesterol and its ester.

Sometimes the Gaucher and Schueller-Christian types do not cause death until after ten years. The marrow of the bones may be affected by the pathological changes caused by the deposits of lipid. Especially in Gaucher's disease, the marrow of the vertebral column may be affected. There is a pronounced osseous form which is congenital and familial. The author cites a family in which five brothers were suffering from pathological changes in the vertebral column. In each case the changes had been diagnosed as tuberculous spondylitis. Pick established the differential diagnosis between the two conditions. Gibbous may develop in Gaucher's disease as well as tuberculous spondylitis. However in the former condition the interarticular disks are preserved whereas in the latter they are destroyed. In the former there is no evidence of osseous regeneration leading to synostosis. In Gaucher's disease as well as in tuberculous spondylitis there is severe pain in the spine (lumbago) and other bones which is at times persistent and at times transient. The article includes a photograph of a vertebral column affected with Gaucher's disease from Pick's collection of specimens. It resembles the illustrations of osteoporosis presented by Schmorl and Junghans. In this condition the tension caused by the intervertebral disks produces atrophy of the vertebral bodies with penetration of the disks into the vertebral bodies, especially in the lumbar region.

Lyon reports the case of a man thirty-eight years of age who had suffered from bleeding from the nose and intestines for fifteen years. The patient had pronounced anemia, a characteristic brownish-yellow color and marked enlargement of the liver and spleen. The most important symptom for years had been pain in the back with gradual gibbus formation. The patient had worn a supportive corset. All of the

vertebrae were tender to pressure. In the thoracic and lumbar portions of the spine the vertebral bodies were somewhat compressed and the density of their shadows was decreased. On the left side changes in the femur and calcaneus could be detected. Examination of the blood revealed anemia, leucopenia, and thrombopenia. The patient died of hemorrhage from the rectum. Autopsy disclosed typical Gaucher's disease.

The pathological changes which occur quite frequently in the femur often lead to the erroneous diagnosis of tuberculous coxitis. The vertebrae may be involved also in the Schueller-Christian type of disease. In cases of the classical type of generalised xanthomatosis, diabetes insipidus, exophthalmos, defects of the bones, and enlargement of the liver and spleen occur. Often there are characteristic lung findings such as diffuse shadows from sclerosing fibrosis of the pulmonary tissue. The changes in the skull are more pronounced than those in the rest of the skeletal system. In 52 per cent of the cases the bones of the pelvis and the vertebral column are involved. Therefore when this disease is suspected the entire skeleton should be examined roentgenologically. A few cases show attempts at healing.

FRANZ (Z)

DUCTLESS GLANDS

Ellsworth R.: Observations upon a Case of Post-operative Hypoparathyroidism. *Bull. Johns Hopkins Hosp.*, Balt. 1933 lli 131

The case reported was that of a colored woman thirty-six years old. About two and a half years before her admission to the hospital the patient noticed nervousness, palpitation, dyspnea, and sweating. Three months before her admission she was found to have Graves disease and a double partial lobectomy was done. After the operation she was well for two weeks but began to have epigastric distress followed by stiffness in the hands and feet. The attacks were accompanied by a feeling of tenseness and general nervousness.

On physical examination the hands were held with the fingers extended, but flexed at the metacarpal joints, and the thumb was extended and abducted. There was a strongly positive Trousseau sign. Chvostek's and Pool's signs were also positive. On a daily intake of 2 gm. of calcium the serum calcium varied from 5.5 to 6.9 mgm. per 100 c.cm. and on a daily intake of 1 gm. of phosphorus the serum phosphorus varied from 5.2 to 6.7 mgm. per 100 c.cm. When the daily intake of phosphorus was decreased to 0.27 gm. the serum phosphorus decreased from 5.5 to 4.9 mgm. per 100 c.cm. The serum calcium varied from 7.1 to 7.5 mgm. per 100

c.cm. While the patient was on a constant diet yielding 3 gm. of calcium and 0.37 gm. of phosphorus daily she was given, at different periods of time, viosterol, magnesium carbonate, and parathyroid extract.

The viosterol caused a definite increase in the serum calcium and phosphorus. When magnesium carbonate was given the phosphorus was definitely increased and the calcium somewhat decreased. When the parathormone was given the serum calcium was definitely increased, the phosphorus was decreased, and the patient was almost completely relieved of all symptoms. When she was given large doses of calcium, namely 4 gm. daily in the form of calcium chloride, the Trousseau sign was delayed, the serum calcium rose from 6.6 to 8.5 mgm. and the inorganic phosphorus fell from 6.9 to 4.5 mgm. per 100 c.cm.

The classical findings of idiopathic parathyroidism are (1) a high content of phosphorus in the serum, (2) a low content of calcium in the serum (3) a low content of phosphorus in the urine, (4) a low content of calcium in the urine, (5) tetany often exaggerated by exertion, (6) a tendency toward cataract formation, and (7) normal roentgen appearance of the bones.

In the cases reported it was found that the degree of tetany depended not only on the serum-calcium level, but also on the serum-phosphorus level. When the calcium was high, active tetany was precipitated if the phosphorus was also high. Even though it caused an increase in the serum calcium, the administration of irradiated ergosterol did not have a good effect because, concomitant with this increase there was also an increase in the serum phosphorus. Magnesium salts caused a definite increase in the serum phosphorus, but the tetany became latent, a fact suggesting that the magnesium may have rendered inactive some of the inorganic phosphorus in the blood. Parathyroid

extract caused a cessation of all symptoms associated with a rise in the serum calcium and a decrease in the serum phosphorus.

ALTON OCHSNER, M.D.

Cecil, H. L.: Hypertension, Obesity Virilism, and Pseudohermaphroditism as Caused by Suprarenal Tumors. *J. Am. M. Ass.* 1933, 9, 463.

Pheochromocytomata cause paroxysmal hypertension by producing large amounts of epinephrin and suddenly releasing them into the blood stream. Sometimes they cause a constant hypertension. Neither atrophy nor absence of the opposite suprarenal has been found associated with these tumors. Hypertension is caused also by cortical tumors. Following removal of the tumor the pressure returns to normal.

In pseudohermaphroditism of the congenital type, removal of one suprarenal, even when it was enlarged, has had no beneficial effect on the anomaly. Much can be done by plastic surgery. The sex should be determined and the anomaly corrected accordingly.

In pseudohermaphroditism of the acquired type removal of the tumor or in cases with hyperplasia, of one suprarenal, has been followed by very gratifying results.

There are great variations in the type and degree of the change. In boys, the change is toward the adult. In girls and women it is toward the adult male type. After puberty in males and after the menopause in females no change is noted.

A review of cases shows rather conclusively that the suprarenal opposite the tumor atrophies and is not congenitally absent. All degrees of atrophy from a slight beginning to total absence have been observed. This fact is of the greatest importance, as the removal of one suprarenal cannot be done with safety unless the condition of the other is determined.

HOWARD A. MCKENNEY, M.D.

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COLLECTIVE REVIEWS

GASTRODUODENAL ULCER

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THE 1932 literature on gastroduodenal ulceration shows a trend which is interestingly different from that of previous years. There are fewer surgical reports describing the end-results obtained from the various types of surgical intervention, particularly those of a radical nature. Internists and surgeons still debate the relative merits of their respective types of therapy but in general the literature shows a tendency toward closer coöperation between the surgeon and internist. There is also noted a critical investigative spirit as to etiology physiology pathogenesis and psychoneurological factors in the genesis of peptic ulcer.

One of the most constructive reports on the subject was presented by Cushing (22) in his paper entitled Peptic Ulcers and the Inter-brain. Cushing demonstrated that lesions of the upper gastro-intestinal tract may be associated with intracranial disease, thus substantiating the neurogenic theory of gastroduodenal ulceration. Of the 11 cases which are reported in detail, 10 came to autopsy early enough practically to preclude any possibility of postmortem digestion. The findings varied from acute hemorrhagic erosion and perforation to oesophagogastric malacia. The literature is reviewed and confirmatory evidence presented for correlating cranial lesions with gastro-intestinal lesions. Rokitsansky's teachings, which first suggested that an ulcerative process of the upper alimentary tract may be of neurogenic origin is emphasized and additional evidence given, not only from Cushing's clinic, but also from many other important sources. Whether these peptic lesions may be due to para-

sympathetic (vagal) stimulation or to a sympathetic paralysis must remain conjectural until more precise data are at hand. However in man stimulation of the parasympathetic center by intraventricular injections of pilocarpin or pnturin causes increased gastric motility hyper-tonicity and hypersecretion plus retching and vomiting. Similar results with observed patches of hyperæmia in the gastric mucosa have been shown to follow direct electrical excitation of the tuber cinereum in animals. Under normal conditions the parasympathetic system is undoubtedly strongly affected by cortical as well as psychic influences. This may lead to direct stimulation of the tuber or its descending fiber tracts which is theoretically the same thing as a functional release of the vagus from inhibition by antagonistic sympathetic fibers. Hypersecretion, hyperchlorhydria, hypermotility and hyper-tonicity of the gastro-intestinal tract, most marked in the pyloric segment, are thus induced. Spasmodic contracture of the musculature possibly supplemented by local spasms of the terminal blood vessels, produces small areas of ischæmia or hemorrhagic infarction leaving the overlying mucosa exposed to the digestive effects of its own hyperacid juices. It is thus possible to reconcile and correlate the neurogenic theory of ulceration sponsored by Rokitsansky with Virchow's theory of a primary local cause as well as with von Bergmann's spasmodic theory irrespective of whether the lesions are considered simple erosions, acute perforations, autodigestive softening, or chronic ulceration involving the upper gastro-intestinal tract. Although all this may appear

largely theoretical, it can certainly be used not only to correlate and explain the psychiatric treatment of peptic ulcer but also to establish continuity with the basic investigations of physiologists on the relationship between the autonomic nervous system and gastro-intestinal function.

Meyer's (71) interesting paper on the psychiatric aspects of gastro-enterology has the objective of directing the physician, who is taught almost exclusively to study *parts of the organism and their functions* to take an interest also in the *total functions of the person*. Meyer's plan was to correlate what he terms "personality functions, or mental factors, and consideration of part function and "total function of the patient.

Is the malfunction of the stomach or colon structural functional, due to some local disorder or is it essentially derangement due to collisions with other particular components either of the gastro-intestinal structure and function or some other organ complexes or of personality functions? We may find in a more or less autonomic form, a neurological involvement of the vagosympathetic balance. This again can readily be correlated with the new theory presented by Cushing (12).

Ryle (92) in an article entitled "The Natural History of Duodenal Ulcer" has again stressed the fact that persons with ulcer are distinctive human types or constitutions within whose constitutions we may ascertain certain physical, biochemical and psychological variances which, between them, supply what we may call the "ulcer diathesis." He says, "We find again and again that our patients are lean and nervous, most often tense and muscular with brisk mental and physical reactions. Psychologically these folk are energetic, restless, conscientious, intent on their projects, and not seldom, given to anxiety of mind. Recognition of these facts is essential to a proper understanding of the disease and to handling of the cases. Highly nervous individuals should often be deemed unsuitable for surgical intervention. Psychological as well as physical requirements must be carefully studied."

Draper and Touraine (17) have followed the same general trend and conclude from their observations that there is a "peptic ulcer race" with characteristic inherited qualities which are modified by worldly influences. There are definite ulcer families which have characteristic genetic, anthropomorphic and anthropopsychic similarities. The similarity between persons with peptic ulcer and sympathectomized animals is emphasized. "It would seem that these peptic ulcer people possess an inadequate sympathetic

nervous system. This inadequacy may be the result either of an inherited weakness or of a wearing out process." Twenty-two cases of gastroduodenal lesions afforded the basis for an explanation of organic disease in individuals of the susceptible type. To Draper and Touraine, analytical psychology seems at present to afford the most satisfactory approach.

Boye (13) has a very similar opinion as to the cause. He believes it is of the greatest importance to recognize a neurosomatic constitution characterized by marked nervous symptoms in which peptic ulcer occurs only as "an episode in the neurosis." The vegetative nervous system constitutes a point of contact between the psychic and the somatic systems which at no time can be separated. Neurovegetative disharmony has been emphasized by von Bergmann to be of the greatest importance in ulcer genesis. Most patients show marked neurovegetative symptoms prior to definite ulcer formation. Experimental vagus irritation has been followed by gastritis which may readily lead to true ulceration. These patients show cardiovascular instability profuse sweating (hyperhidrosis) exaggerated reflexes, dilated pupils with unusually rapid response to light, bradycardia, and stigmata of instability of the vegetative nervous system, as well as other psychic lability.

According to Duschl (18) histological examination of the nerves of persons with ulcer showed changes such as pyknosis, shrinking and swelling of the ganglion cells, round-cell invasion, and perineural lymphatic infiltration not only in areas adjacent to the ulcer but also at a distance from the lesion. A fine, regularly streaked, localized deposition of fat was a constant finding. This was associated with chronic catarrh of the entire gastric mucosa and a marked localized chronic gastritis in the immediate vicinity of the ulcer. However the chronic gastritis is not typical of ulcerated stomach alone, since it may be found in patients dying from causes other than ulcer.

The exact relationship of the vagus nerve to chronic peptic ulcer has long interested clinicians and physiologists. Best and Orator (6) performed a series of interesting experiments to demonstrate the pathological relationship between primary traumatic ulceration or inflammation in the stomach wall and pathological changes of the vagi nerves or various nuclei in the medulla oblongata. Injections of staphylococcus aureus into the stomach walls of 10 rabbits leading to fatal peritonitis showed "no definite constant histological changes in the nerves. A few sections showed very minor pathological changes such as slight

vacuolation, slight tyrolysis, or a slight decrease in clearness and sharpness of the cell body outlines. These changes were minor and indefinite and were found, not only in the vagi, but also in the sciatic nerve which was used as a control. The minor pathological changes in the nerves could be explained easily on a general toxic basis. As it was impossible to establish a pathological relationship between the vagi nerves with the primary lesions in the stomach, the procedure was then reversed and the vagus chronically irritated in an attempt to induce pathological changes in the stomach. Strips of magnesium were wrapped around the right or left vagus nerves of 6 dogs having Pavlov pouches. In periods of from one to four months after the vagus operation the abdomen was opened and the stomach and duodenum were carefully examined. Ulcer of the stomach or duodenum was not found in any case.

The vagus nerve and its relationship to gastric secretion was further studied in dogs by Friedenwald and Feldman (39), who sectioned the vagus at various levels, having first determined a standard response in these animals to 50 c.cm. of 7 per cent alcohol as well as to 0.0015 gm. of histamin. The experimental observation period varied from three to twelve months. The results of the experiments showed that while at times changes in gastric secretion occurred because of section of the vagus nerve, these are inconstant, there is likewise a general tendency for this secretion to return to normal when it is diminished as a result of the operation. An interesting finding of this study was the marked decrease of response following histamin stimulation in the animals in which the anterior branch of the left vagus nerve was severed, although the response to the alcohol test meal compared closely with that observed in the normal. When the left vagus nerve was severed in the neck, practically the same results were obtained. Section of the right vagus had practically no effect upon gastric secretion.

Baxter (6) stimulated the splanchnic nerve electrically just below the diaphragm and severed the vagi in the neck or ligated them in the vicinity of the oesophagus below the diaphragm. In all cases, by rhythmic stimulation of the splanchnic nerves, he obtained secretion of thick, alkaline mucoid fluid beginning during the first hour of stimulation and continuing at a steady rate throughout the experiment. The material secreted had a moderate peptic activity with a chloride content slightly lower than that of gastric juice. Atropin did not abolish the secretion. The same type of secretion was obtained in a series of experiments with the repeated injection of epi-

nephrin. These results indicated that the sympathetic nervous system has a definite relation to the mucoid secretion of the gastric mucosa.

An experimental study by Pacetto (79) on the genesis of gastric ulcer demonstrated the interesting fact that in any productive experimental investigation of this subject both the vagi and the sympathetics must be considered. In his research on the rôle of the nervous system in the genesis of chronic gastric ulcers, Pacetto found that negative results followed section of either the vagi or the sympathetics, but when the vagi were damaged by injection and the sympathetics were severed in the same manner ulcers consistently resulted. Forty days after the initial intervention these lesions were very extensive. Pacetto concluded, therefore, that the damage to the autonomic nervous system is the most important factor in ulcer genesis.

In a study of the secretion of gastric pouches which were transplanted subcutaneously with intact blood vessels, Klein and Arnheim (55) demonstrated that an investigation of gastric secretion requires more than a consideration of the various nerve components innervating the gastroduodenal mucosa. From two to four weeks after the transplantation the blood vessels were severed and in this way pouches entirely free of intrinsic nerves and with a new peripheral circulation were obtained. Any stimulants leading to secretion from such a pouch must be humoral. The pouches responded to the stimulation of a meal by the secretion of hydrochloric acid and pepsin. Histamin in 0.0005-gm. doses also produced a secretion after a latent period of fifteen or twenty minutes. The results of these experiments were interpreted as added proof that the stimulation was carried to the gastric glands through the blood stream. This stimulation may act upon either the intrinsic gastric plexus or the gastric secretory cells themselves. To determine which is affected, Klein and Arnheim prepared a gastric pouch of the gastric mucosa and submucosa alone removing the muscularis and serosa to deprive the transplanted gastric pouch of Auerbach's plexus. The response to food and histamin in the transplanted gastric pouches deprived of Auerbach's plexus as well as of vagus and sympathetic nerves and normal gastric blood supply was the same as that in similar pouches in which the muscularis, serosa, and Auerbach's plexus were intact. This indicated that the stimuli for secretion apparently reached the pouch through the new abdominal blood supply and acted on the secretory cells themselves or upon the neurocellular substances. Of further interest was the fact that the secretion could be

inhibited by atropin, but still responded to histamin.

As a result of further study of the use of histamin as a stimulant to the gastric mucosa, clinical and experimental investigations on gastric secretion have made definite progress in classifying true achlorhydria with the associated anemias. Vineberg and Babkin (108) have demonstrated in the dog that histamin stimulates acid secretion alone. Mucin and other constituents are unaffected. In general, this has been confirmed clinically by many reports.

Comfort and Osterberg (20) found histamin of value in distinguishing true from false achylia. Their experience led them to conclude that the response of gastric secretion to histamin is of greater value than the response of the Ewald meal in the differential diagnosis of peptic ulcer and gastric carcinoma. The advantages of the stimulus of histamin over the Ewald meal are not great enough to warrant the adoption of the fractional method with stimulation by histamin as a routine. Histamin is of most value in chemical studies after resection of the stomach or gastro-enterostomy, when it discloses free acidity which has been masked by the neutralizing influences of the base in regurgitated duodenal or jejunal juices.

Gastric achylia was studied by Streicher (101) who contrasted histamin and 7 per cent alcohol as a stimulant of gastric secretion. Streicher's observations indicated that in some cases histamin is a more powerful stimulant of gastric acidity than 7 per cent alcohol, but that in 40 per cent of cases the gastric acidity curve stimulated by alcohol is the same as that of histamin. However, some of the patients had marked toxic reactions which were alarming enough in their severity to more than counterbalance "the comparatively infinitesimal amount of information gained."

The ability to determine the presence of an achlorhydria definitely has, however, stimulated interest in this subject and has led to further work on the anemias following achylia gastrica.

In a clinical study of achlorhydria, Moore (74) found 272 cases of achlorhydria in 1,283 patients. Thirty-three of these occurred in 83 cases of diabetes mellitus and 37 in 47 cases of hyperthyroidism. There were 33 cases of non-megalo-cytic anemia in which the patients complained of weakness, palpitation, dyspnea, and digestive disorders. A frequent finding was atrophic superficial glossitis very similar to the type found in pernicious anemia. Paresthesias and signs suggesting subacute combined degeneration of the cord were not observed. There was usually a marked

hemoglobin deficiency and the degree of anisocytosis and poikilocytosis was usually proportional to the severity of the anemia. With the exception of the associated achlorhydria, the cause of this non-megalo-cytic anemia is not known.

It is probably due to deficient formation of hemoglobin. It is not hemolytic or hemorrhagic in origin and its appropriate treatment with iron gives eminently satisfactory results."

Hurst (52) has collected 7 typical cases of Addisonian pernicious anemia following simple gastro-enterostomy without resection. Vaughan (106) has added 3 more and has reviewed the literature on 122 similar cases of anemia following gastric operations.

Two additional cases were described by Rowlands and Levi Simpson (91) who believe that an important etiological factor is the post-operative chronic diarrhea, which is probably secondary to an unusually rapid emptying time of the stomach. The possible relationship between this type of anemia and carcinoma of the stomach becomes apparent. Achlorhydria occurs frequently with malignancy of the stomach, and it is barely possible that (30) As time goes on and earlier diagnosis and improvements in operative technique enable more patients to survive gastrectomy for a sufficient length of time, pernicious anemia will probably be encountered more frequently. Indeed, it may be found that every patient whose stomach has been completely removed will develop pernicious anemia. Partial resection of the stomach may also be a sufficient cause for pernicious anemia. The question may be raised as to whether carcinoma of the stomach itself by destroying a large portion of the gastric mucosa, may cause pernicious anemia. The question of whether pernicious anemia may be caused by gastric carcinoma can be solved only by a reliable criterion for distinguishing pernicious from secondary anemia.

A study of the relationship between gastric neoplasms and achlorhydria leads to the much debated problem of gastric carcinoma and chronic gastric ulcer. This has been clarified during the last year by a study of the basic histopathological findings.

In a critical and strictly objective report on the etiological relationship between chronic gastric ulcer and gastric carcinoma, Kittelson (54) reviewed the important contributions on this subject and showed the necessity for a more accurate histopathological definition of malignancy before any definite statistical conclusion may be drawn. Anacidity or hypo-acidity is not an important criterion. "The topography of gastric ulcer and

gastric carcinoma is the same. Eighty per cent of gastric cancers originate in the pyloric end of the stomach. The pathological rules whereby a certain ulcer is to be adjudged simple or malignant have not been definitely agreed upon.⁷ However the investigations of Holmes and Hampton (51) on the incidence of carcinoma in certain chronic ulcerating lesions of the stomach would lead to the conclusion that the location of the lesion is of considerable diagnostic value because 75 of 121 carcinomata occurred in the prepyloric area of the stomach. From a study of the literature and their own cases they conclude that it is fair to state that a chronic indurated ulcerating lesion occurring in the pyloric antrum within 1 in. of the pylorus but without involving the pylorus should be considered malignant unless proved to be otherwise and that proof of the absence of malignancy in such lesions is obtained only by serial sections and careful microscopic examination. It is not safe to interpret such lesions as benign from roentgen examination alone or from observation on the operating table.

Cole, in discussing their paper took radical exception. He feared that clinicians less experienced in roentgenology would attempt to generalize from the data presented by Holmes and Hampton to solve their gastric cancer problems. He said "Acceptance of topography as a prime factor in the differential diagnosis of malignant tumors of the stomach would set back the science of roentgenological diagnosis of gastro-intestinal lesions by nearly two decades in fact almost to the period when reports read, There is a filling defect of the stomach which can be proved malignant or non-malignant only by surgical exploration. In fact, I think it would be worse than this because those inexperienced in interpretation may derive a sense of false security of non malignancy in lesions along the lesser curvature, and still worse, be led to innumerable partial gastrectomies for non malignant lesions that would heal in a short time under proper medical treatment. The fatalities as a result of operative intervention in non-malignant pyloric lesions would far exceed the five- or even three-year cures of gastric ulcer that might result from partial gastrectomy. The differentiation between malignant and non malignant lesions of this region can be made in the vast majority of cases based on a single complete serial examination. In the few cases in which this differential diagnosis cannot be made from a single examination, a subsequent examination in two or three weeks will almost certainly give a differential diagnosis between a benign and a malignant lesion."

An attempt to clarify the confusing and conflicting opinions on the relationship between peptic ulcer and gastric carcinoma was made by Newcomb (77) in a study of 307 stomachs with 154 simple chronic gastric ulcers, 46 gastric carcinomata, 75 duodenal ulcers, 7 jejunal ulcers, 4 subacute gastric ulcers, and 112 surgical specimens of carcinoma of the intestine. Newcomb's objective was to demonstrate reliable histological criteria for differentiating between the 2 lesions. It was found that as the healing process of the ulcer progressed, the overhanging muscularis mucosae and the spread-out fibers of the muscularis became approximated and eventually fused. This close approximation of the muscularis mucosae and muscularis was present in some part in all but 2 ulcers in the series. The 33 gastric carcinomata studied showed that the malignant cells grew and spread centrifugally in all directions separating the muscularis mucosae from the muscularis. The finding of such fusion is the only definite evidence of previous ulceration, and before it is possible to conclude that any carcinoma developed in a previously existing ulcer *this evidence must exist*. It is suggested that the presence of these criteria is as valuable as the demonstration of the tubercle bacillus in the diagnosis of tuberculosis.

The medical treatment of gastroduodenal ulceration has shown few new developments. The advocates of the pepsin treatment developed by Glaesner (43) continue to report encouraging results. In cases of postoperative gastrojejunal ulcers, Docimo (26) obtained practically no results from this therapy. Villert (107) is encouraged by the results he has obtained by autohemotherapy. Aluminum hydroxide is recommended by Einsel and Rowland (31). Emery (32) has found X ray treatment of value. Martin (65) regards foreign protein therapy of value. Kohn (57) has obtained results which have been most encouraging in many instances little short of miraculous by the intravenous administration of various concentrations of citrate and saline properly buffered. Brown (16) and Atkinson (1) obtained encouraging results with Fogelson's gastric mucin therapy of peptic ulcer. Bloch and Rosenberg's (11) experiences with mucin therapy have been on the whole relatively discouraging. It is interesting to note that Leriche (61) hopes to clarify not only the etiology but also the treatment of peptic ulcer by a more thorough investigation of mucin secretion in the gastro-intestinal tract. Bucher (18) attempted such a study and reported its colloidal chemistry laying particular emphasis on the swelling process which occurred in acid media.

and increased the elasticity as well as the internal coherence and viscosity. He concluded that the protective action of the gastric mucus is due to the fact that in the state of acid coagulation it presents the optimum of mechanical quality as well as of chemical inactivity or neutrality. A study of the antipeptic capacity of mucin by Babkin and Komarov (2) has confirmed Fogelson's earlier investigations. In addition, Babkin has fractionated the crude mucin and suggested greater possibilities of control of peptic activity by the lipid and mucotin-sulphuric acid fractions.

The experimental studies in gastric physiology by Shay Katz, and Schloss (94) may be considered significant in establishing in man the doubtful rôle played by duodenal regurgitation in the control of gastric acidity. The results of the clinical experiments of these investigators, substantiated by the results obtained by others in dogs, certainly seem to warrant a skeptical attitude regarding the efficacy of duodenal regurgitation in the control of gastric acidity. By using bromsulphalein, which is secreted by the liver into the second portion of the duodenum and is readily recognized, Shay Katz, and Schloss had available an ideal substance for testing duodenal regurgitation. The patients were studied for duodenal regurgitation at successive weekly intervals with the use of test meals of 500 c.c.m. of tap water at room temperature, a solution of hydrochloric acid varying from 0.3 to 0.5 per cent, and a solution of sodium bicarbonate varying from 1 to 5 per cent. These investigators were entirely unable to correlate the amount of duodenal regurgitation as measured by the concentration of dye in gastric contents with the degree of change of gastric acidity. The greatest amount of dye regurgitated in all the experiments yielded a reading of 360 per cent and occurred during the course of a plain water meal in a case of true achylia gastrica. When acid was introduced into the stomach there was a rapid reduction of acidity which could not be secondary to duodenal regurgitation and was interpreted as neither neutralization nor dilution but probably absorption.

Similar reduction of pH in hydrochloric acid or sulphuric acid was observed by Goldberg (44) in isolated gastric pouches. Goldberg also concluded that the stomach has an intrinsic regulatory mechanism for controlling its pH.

Conversely after a series of ingenious experiments, Matthews and Dragstedt (68) conclude that preventing the regurgitation of alkaline duodenal juices into the stomach of normal dogs by fixing a valve in the pylorus raised both the

free and the total acidity of the gastric content after a standard test meal, delayed the neutralization of 0.5 per cent hydrochloric acid placed in the stomach, delayed the healing of acute ulcers in the gastric mucosa produced by the injection of silver nitrate, and caused the appearance of spontaneous ulcers in transplants of intestinal mucosa sutured into defects in the stomach wall.

In studies on the effect of subtotal gastric resection in the dog, Fauley, Strauss, and Ivy (33) found that resection of at least 66 per cent of the stomach in 10 of 12 dogs resulted in varying degrees of compensatory hypertrophy of the gastric remnant. The emptying time of the stomach was permanently decreased in spite of hypertrophy. The acidity of the gastric contents returned practically to normal in from three to five months.

An experimental study of resection of the pylorus and its effect on the secretory and motor functions of the stomach by Thompson (102) demonstrated that the acid values of gastric contents subsequent to the ingestion of test meals varied directly with the amount of pylorus removed. Removal of the pyloric sphincter had practically no effect upon the acid values of the gastric contents. Removal of the distal half of the pyloric antrum slightly reduced acid values, while removal of the entire pyloric antrum led to marked reduction of the hydrogen-ion concentration and total acidity no free acid being present. *However when histamin was used as a gastric stimulant there was no reduction in acid values regardless of the amount of stomach resected.* When Pavlov pouches were constructed from the fundi of pylorotomized dogs, the gastric acidities were lower free hydrochloric acid being absent, but the secretion of the Pavlov pouch made from the fundus had normal acid values suggesting that the post-operative achlorhydria was more apparent than real. The part played by duodenal juices in the reduction of gastric acidity following pylorotomy was studied by substituting a Roux jejunojejunostomy in 3 animals which had previously been subjected to a Polya gastrojejunal anastomosis. Exclusion of the duodenal contents from the stomach by operative procedures resulted in only slightly higher acid values in the gastric contents. "This indicates that the duodenal juices which enter the stomach normally or after resection of the pylorus possess a slight degree of buffer value neutralizing power."

The factors influencing the prognosis in the medical treatment of duodenal ulcer were studied by Jordan and Kiefer (53) in 60 patients with duodenal ulcer who had undergone medical treatment in the Lahey Clinic with unsatisfactory end-

results. A history of hæmatemesis or melæna was obtained in 15 per cent of the cases with successful results and in 55 per cent of those with unsuccessful results. The relatively much higher incidence of hæmorrhage, particularly repeated hæmorrhage, in cases with unsuccessful results indicates that the frequency of hæmorrhage is of considerable value in the estimation of the probability of success or failure of medical treatment. Night pain and distress were twice as common in the cases with unsuccessful results. Physical findings were relatively unimportant in the prognosis. The disappearance of the duodenal deformity in 70 per cent of the cases with successful results and improvement of the duodenal outline in 20 per cent more, leaving only 10 per cent in which the duodenal deformity remained unchanged is of particular significance when compared with the lack of improvement in the X ray defect in 51 per cent of the cases in which the pain recurred later. Gastric retention was 4 times as common in the cases with unsuccessful results although its presence does not preclude satisfactory recovery under medical management.

Hæmorrhage is important not only in the prognosis but also in the mortality associated with medical management, and according to Chessman (19) may be used as a guide in determining when surgical intervention is indicated for gastroduodenal bleeding. The question arises whether or not the history offers any indication as to the probable failure of medical treatment.

It is exceptional for a single hæmorrhage from peptic ulcer to lead to death. The striking fact about the fatal cases was that in all of them the hæmorrhage continued or recurred after the patient's admission to the hospital in spite of medical treatment. In the cases of 62 patients admitted for gross hæmorrhage in which the bleeding continued or recurred twenty-four hours after the beginning of treatment, there were 46 fatalities, a mortality of 74 per cent. Postmortem examination of 45 of these patients revealed that the common cause of the repeated hæmorrhage was a partially eroded vessel of considerable size in the floor of the ulcer. In most cases the hæmorrhage continued for several days. In 1 case there was continued bleeding for one month before death. The shortest time from the onset of the hæmorrhage to death was forty-eight hours. Accordingly there was ample time for surgical intervention in all cases if it had been considered desirable.

Lahey (59) regards hæmorrhage as an indication for surgical intervention, but believes the most dangerous time to operate upon patients

with gastroduodenal ulcer is immediately following the occurrence of bleeding. The mortality due to hæmorrhage from a gastric or duodenal ulcer in the Lahey Clinic is relatively low, not more than 2 per cent. 'With transfusions to restore the condition of these patients we may in certain most cases, delay surgery with the very probable hope that the hæmorrhage will cease and they can be operated upon under more favorable conditions following transfusion when they have at least in a considerable measure regained their vascular balance.'

In general, surgical opinion agrees with Lahey (60) who believes that of the indirect operations, pyloroplasty is superior to gastroenterostomy and is associated with a lower mortality. Of the direct operations, partial gastrectomy yields the highest percentage of cures, but has the highest mortality.

In view of the present limited knowledge of the cause of gastroduodenal ulceration we are hardly justified in being too dogmatic about any method of treatment, be it medical or surgical. Before starting treatment in any case consideration must be given not only to the pathological conditions present and the patient's previous history and his psychic constitution, but also to his capacity or intention to coöperate and appreciation of the necessity of modifying his habits of life to reduce the incidence of recurrence. When this has been done an attempt should be made to profit from our previous experiences and treat our patients always with the objective of affording them the most marked relief from symptoms with minimal mortality and morbidity.

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ABDOMINAL PREGNANCY

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OUR study is based on 236 cases, 226 from the literature and 10 of our own. Two of the latter were seen in private practice and 8 at the Cook County Hospital.

Many case reports in the literature were incomplete. Nearly all mentioned what was done at operation, but in many of them other details which we desired to study were omitted. Not every case has been included in our review as some of the articles were inaccessible.

Abdominal pregnancy was recognized in patients as young as fifteen and as old as sixty-four years. The sixty-four year-old patient had carried her fetus for forty years. The age groups were as follows:

TABLE I.—AGE GROUPS

Years	Cases	Years	Cases
15-19	7	35-39	56
20-24	27	40+	13
25-29	51	64	
30-34	45	Not recorded.	34

Abdominal pregnancy occurred most frequently therefore, between the ages of twenty and forty years, as was to be expected. It was most frequent also in the first and second pregnancies as is demonstrated by Table II.

TABLE II.—NUMBER OF PREGNANCIES

No. of pregnancies	Patients	No. of pregnancies	Patients
1	60	8	1
2	62	9	6
3	29	10	0
4	8	1	0
5	0	2	
6	8	Not recorded.	33
7	6		

Sixty-two of the women had not been pregnant previously. The character of the previous pregnancies of the others was as follows:

TABLE III.—CHARACTER OF PREVIOUS PREGNANCIES

Previous pregnancies	Cases
Term only	64
Term; abortion	20
Abortion only	16
Term abortion ectopic	1
Term ectopic	3
Ectopic only	1
Abortion ectopic	
Not recorded	79

Only 4 of the patients had had a previous ectopic pregnancy.

The incidence of abdominal pregnancy according to race is shown in Table IV.

TABLE IV.—RACE INCIDENCE OF ABDOMINAL PREGNANCY

Race	Patients	Race	Patients
White	143	Indian or Hind	9
Colored	35	Siamese	1
Japanese	3	Burmese	1
Chinese		Not recorded	41
Filipino	1		

Whether we should conclude from the figures in Table IV that the incidence of abdominal pregnancy is highest in the white and colored races, the authors are not prepared to say. It is possible that this type of pregnancy was not reported by physicians in the Orient.

The period of amenorrhoea was noted in 86 cases, as shown in Table V. Eighty per cent of the patients had amenorrhoea for six months or longer. The patient with amenorrhoea for twenty-eight months was operated upon in the fourteenth month for full-term abdominal pregnancy. Drainage from the wound continued for fourteen months. At the end of that time a second operation was performed and menstruation began again. In 1 case there was no period of amenorrhoea.

TABLE V.—PERIOD OF AMENORRHEA

Period	Patients	Period	Patients
6 weeks	5	10 months	8
3-4 months	7	11 months	4
5 months	3	12-15 months	4
6 months	3	16 months	1
7 months	9	17 months	1
8 months	15	18 months	1
9 months	24	Not recorded	151

As the character of the last menstrual period was mentioned in only a few instances we may conclude that there was very little irregularity. In 1 case, the period was fifteen days late and in 2 cases there was continued spotting. Early bleeding that is occurring within the first three months of the pregnancy, was recorded in 62 cases. In some of the cases bleeding occurred late. In 11 cases there was shock. In 12 cases no bleeding occurred throughout the pregnancy. In 161 cases there was no record with regard to the occurrence or non-occurrence of bleeding. The incidence of bleeding in the others is shown in Table VI.

TABLE VI.—BLEEDING

Type	Early	Late
Spotting	35	5
Continuous	10	15
Irregular	17	22
Clois		5

Severe shock before operation was evidently infrequent since it was recorded in only a few cases. In a number of cases shock occurred early in the pregnancy and a diagnosis of ruptured ectopic pregnancy was made but operation was refused. Fainting and dizziness were rather frequent, as is seen in Table VII. The 5 patients with severe pain were more or less confined to bed during part or all of the latter half of pregnancy. Intestinal symptoms were noted in a number of

TABLE VII.—SYMPTOMS

Symptoms	Cases
Dizziness	9
Fainting	34
Pain	
Upper abdomen	26
Lower abdomen	109
Upper and lower abdomen	1
Cramps	7
Severe pain (location not recorded)	5
Anorexia	1
Nausea	6
Vomiting	20
Nausea and vomiting	15
Diarrhea	2
Constipation or obstipation	13
Marked loss of weight	2
No symptoms	14
Not recorded	75

reports. There seems to be no uniformity as to the time nausea or vomiting or both may occur. In a few of the cases reviewed the intestinal symptoms were very pronounced.

The location of the fetus was noted in 58 cases in which the pregnancy advanced to the seventh month or more. The fetus was located high in the abdomen in 17 and low in the abdomen or in the pelvis in 20. In 21 cases it lay transversely. Because of the frequency of transverse presentation in abdominal pregnancy the obstetrician should think of abdominal pregnancy in the case of every patient with a transverse presentation.

Abdominal pregnancy was seldom complicated by other diseases or tumors. Rupture of the uterus was recorded in 3 cases. In 1 it occurred in an old cesarean section scar. In 2 it followed trauma and the pregnancy was allowed to continue. Toxemia of pregnancy developed in 8 cases and pre-eclampsia or eclampsia in 6. Fibroids and ovarian cysts were each found in 3 cases.

In a number of cases fetal life was not felt until late as is shown in Table VIII. Fetal death was noted as late as twelve months after the last menstrual period. As this information was obtained from patients it is questionable whether the reports are accurate.

TABLE VIII.—PERIOD AT WHICH FETAL LIFE WAS FIRST FELT

Period	Cases	Period	Cases
Fourteenth week	4	Sixth month	1
Fourth month	15	Seventh month	1
Fifth month	23	Not recorded	192

TABLE IX.—PERIOD AT WHICH FETAL LIFE CEASED

Period	Cases	Period	Cases
Fifth month	1	Tenth month	8
Sixth month	5	Eleventh month	1
Seventh month	21	Twelfth month	2
Eighth month	19	Not recorded	170
Ninth month	18		

In the first trimester of pregnancy the presence of an ectopic pregnancy can usually be recognized but the abdominal location of an ectopic pregnancy can be determined only by pathological examination. In the second and third trimesters the symptoms may be similar and the diagnosis is made directly on the basis of a history of pain in one iliac fossa associated with spotting in the sixth or eighth week of pregnancy which is indicative of the time of occurrence of the tubal abortion or rupture giving rise to the abdominal pregnancy. In primary abdominal pregnancy there is usually no history of pain or bleeding.

The course of the pregnancy is generally characterized by pain in the iliac fossa or around the umbilicus. Term is reached, but labor does not begin or the abdominal distress is mistaken for labor. Abdominal and vaginal examinations are of importance in the diagnosis. On abdominal palpation the abdomen is found to be sensitive but no uterine contractions can be stimulated. The round ligaments cannot be palpated. The child is very readily felt and is close to the surface. The fetal heart tones are loud and near the surface. The child usually lies in an abnormal position, i. e. a transverse or oblique position or high in the abdomen. Occasionally another mass, the non pregnant uterus, may be palpable.

On vaginal examination the cervix is usually found high behind the symphysis in an abnormal position or pushed down into the vagina so that it reaches or extends out of the orifice. The corpus may be felt as a structure separate from the gestation sac, but associated with the cervix. Careful exploration of the uterine cavity with a sound may be of further diagnostic aid although in 1 of our own cases the uterus was perforated by a sound. A ray visualization of the uterine cavity with the aid of lipiodol may help and a roentgenogram may clearly indicate a peculiar position and an unusual amount of freedom of movement of the child manifested by extension or a strange position of the extremities.

The various conditions with which the abdominal pregnancy was confused are listed in Table X. The value of pituitrin as an aid in the differentiation of full-term intra uterine pregnancy from extra uterine pregnancy is questionable.

The fact that only 35 per cent of the cases of abdominal pregnancy were diagnosed correctly before operation indicated that the signs of the condition should be emphasized more than has been done previously. Aside from the diagnosis of normal pregnancy the most common erroneous diagnosis was that of tumor such as a fibroid or an ovarian cyst. Not infrequently the enlarged non-pregnant uterus was mistaken for the tumor. In cases of early abdominal pregnancy the fetal sac was often mistaken for an ovarian cyst. In the differential diagnosis it must be borne in mind that in early abdominal pregnancy the fetal sac is exquisitely tender.

Table XI gives the time at which death of the fetus occurred. The large number of fetal deaths in the eighth and ninth months can be accounted for by the fact that the abdominal pregnancy was not recognized early enough to permit the birth of a living child. It is our impression that many of the fetuses which died would have lived if the

TABLE X.—PRE-OPERATIVE DIAGNOSES IN 236 ABDOMINAL PREGNANCIES

Diagnosis	Cases
Abdominal pregnancy	83
Normal pregnancy	27
Pregnancy and fibroid tumor	16
Pregnancy and ovarian cyst	15
Placenta previa	6
Abortion	6
Pregnancy and acute appendicitis	5
Pregnancy and intestinal obstruction	4
Pregnancy and pelvic infection	3
Pregnancy and premature separation of placenta	3
Pregnancy with transverse presentation	2
Pregnancy and toxemia and contracted pelvis	1
Pregnancy and gall-bladder disease	1
Pregnancy and peritonitis	1
Pregnancy and cervical obstruction	2
Pregnancy and proclivitas	2
Pelvic tumor and peritonitis	1
Metritis	1
Ruptured uterus	1
Many diagnoses	1
No diagnosis	1
Wrong diagnosis corrected before operation.	13
No diagnosis mentioned	67

mothers had been operated upon early enough. Most of the fetal deaths occurred shortly after the beginning of labor. A few reports stated that a live baby was delivered after several days of "labor" but the majority reported that the death of the fetus occurred within forty-eight hours after the onset of "labor."

TABLE XI.—FETAL DEATHS

Age	Cases	Age	Cases
2-3 months	6	Babies maldeveloped.	3
4-5 months	14	No note of life or death	3
6-7 months	31	Not recorded	18
8-9 months	76		

TABLE XII.—BABIES BORN ALIVE

Age	Cases	Age	Cases
3 months	6	8-9 months	60
4-5 months	4	Not recorded	12
6-7 months	14		

TABLE XIII.—EARLY INFANT MORTALITY

Age	Cases	Age	Cases
1 hour	7	2 days	1
10 hours	4	5 days	1 (miscellaneous)
1 day	6		

In the 86 cases in which the baby was born after six months the infant mortality was 23 per cent, whereas in the 60 cases in which the baby was born alive in the eighth and ninth months, it was about 35 per cent. Therefore the chances of survival of infants born at term of an abdominal pregnancy are not good. We should not encourage a woman with an abdominal pregnancy to go to term to secure a live baby.

The weights of the babies as recorded in some of the reports are shown in Table XIV

TABLE XIV—WEIGHTS OF BABIES

Grams	Babies	Grams	Babies
Less than 750	5	3,500-4,000	13
750-1,500	15	4,000-4,500	7
1,500-2,000	13	4,500+	1
2,000-2,500	20	7,100	1
2,500-3,000	5	Not recorded	143
3,000-3,500	20		

Deformities were noted many times. Several of the babies had more than one type of deformity. Most of the deformities were due to pressure and many were corrected by treatment. Deformities of the head numbered 23, and deformities of the trunk, 7. There were 15 club-feet. One child was reported to be listless and unable to hold up its head at the age of nineteen months. Another had no mouth, anus or eyes. One had pyloric obstruction. Only 8 were recorded as free from deformity. While many of the deformities were corrected by treatment, the high incidence of deformities should be considered before advising a patient to attempt to wait term before submitting to operation.

TABLE XV—ADHESIONS OF PLACENTA OR SAC FOUND AT OPERATION IN 236 ABDOMINAL PREGNANCIES

Placenta	Cases	Sac	Cases
No adhesions	0	No adhesions	3
Adherent to		Adherent to	
Round ligament	0	Round ligament	1
Gall bladder	1	Gall bladder	0
Appendix	5	Appendix	0
Pelvic vessels	3	Pelvic vessels	1
Mesentery	6	Mesentery	6
Liver	8	Liver	0
Bladder	8	Bladder	1
Omentum	16	Omentum	56
Abdominal wall	32	Abdominal wall	19
Ovary	18	Ovary	10
Small bowel	33	Small bowel	56
Pelvic peritoneum	40	Pelvic peritoneum	8
Large bowel	45	Large bowel	51
Fallopian tube	18	Fallopian tube	37
Broad ligament	57	Broad ligament	16
Uterus	67	Uterus	20

The sac was ruptured before operation in 12 cases. The uterus was found to be smaller than an eight weeks' pregnancy in 10 cases and larger in 9. Decidual casts were passed by 5 of the women. Blood and liquor in the abdomen were each noted in 8 patients. Peritonitis was found 6 times, and the sac was infected 9 times. The child was found free in the peritoneal cavity in 12 cases. Shock due to hemorrhage occurred in 31 cases, and peritoneal shock in 7. In 1 of the former delivery occurred by way of the vagina. Five of the women were not delivered.

TABLE XVI.—PROCEDURES AT OPERATION

Procedures	Cases	Procedures	Cases
Placenta		Sac (continued)	
Removed <i>in toto</i>	154	Marsupialized	16
Removed partially	8	Drains	19
Left	32	No drains	46
Marsupialized	15	Marsupialization for	
Drains	59	hemorrhage	20
No drains	76	Transfusions	
No record of disposition	25	Blood	7
		Other	5
Sac		Salpingectomy	
Removed <i>in toto</i>	107	Alone	29
Removed partially	10	With hysterectomy	11
Left	24	Hysterectomy	23

TABLE XVII.—POSTOPERATIVE COURSE

Cases	Cases
Fever	32
Ileus	2
Drainage	
1-5 days	8
6-10 days	8
11-15 days	2
16-20 days	3
21-30 days	3
31-40 days	1
41-50 days	1
100 days	1
14 months	1
Hospitalization	
Not recorded	126
11-15 days	20
16-20 days	16
21-30 days	38
31-40 days	7
41-50 days	16
51-60 days	9
61-70 days	2
71-80 days	1
81-90 days	2

TABLE XVIII.—CAUSES OF DEATH IN 34 (14.3 PER CENT) OF 236 ABDOMINAL PREGNANCIES

Cases	Cases	Cases	Cases
Shock due to hemorrhage at operation	13	Uncontrollable uterine hemorrhage	1
Shock	4	Toxemia	1
Shock without delivery	1	Ileus	1
Peritonitis	8	Pyelonephritis	1
Intestinal obstruction	1	Unknown	3

TABLE XIX.—MORTALITY FOLLOWING DIFFERENT MANAGERMENTS OF PLACENTA

Procedures	Cases	No	Deaths	Per cent
Placenta removed <i>in toto</i>	155	16	10	3
Placenta removed partially	7	1	14	3
Placenta left, marsupialization	14	3	21	4
Placenta left, no marsupialization	30	6	20	0

The maternal mortality was 14.3 per cent. Twenty nine of the women died after operation and 5 died undelivered. The latter were too sick to be operated upon.

Peritonitis and shock accounted for 25 of the 34 deaths. Shock alone accounted for 17 (50 per cent). In reading the case reports it is surprising to note the number of surgeons who persist in attempting to remove the placenta in spite of the severe hemorrhage. We believe that the mortality can be lowered greatly if we desist from interfering with the placental site when it becomes

TABLE XX.—COMPLICATIONS FOLLOWING OPERATION FOR ABDOMINAL PREGNANCY

Complication	Cases
Pelvic abscess	1
Rupture of vagina	3
Faecal fistula	3
Intestinal obstruction	2
Pyelonephritis	1

TABLE XXI.—MISCELLANEOUS INCIDENTS IN THE COURSE OF ABDOMINAL PREGNANCY

Incident	Cases
Induction of labor	
Attempted by bag	3
Attempted by medication	3
Marked loss of weight	1
Dilatation and curvatures	1
Emptied through rectum	2
Dead-fetal casts	3

TABLE XXII.—MATERNAL DEATHS

	No.		No.
On operating table	4	After	
First day	3	14-5 days	3
After		5-60 days	3
2-5 days	6	Undelivered	1

evident that hemorrhage is uncontrollable. Packing, with or without marsupialization, will give the best results. If the placenta is located on the intestines or liver it should be left undisturbed without drainage. Although hemorrhage may occur and prove fatal as the placenta separates or disintegrates, it is far safer to leave the placenta alone, as this accident is rare.

Several obstetricians reported that they attempted to deliver the fetus through the vagina and 1 reported an attempt to deliver through the rectum in a case in which the presenting part had caused marked rectal distention. Such attempts should be emphatically condemned as in the majority of cases it is impossible to control bleeding. Moreover the damage to the maternal soft parts is apt to be severe. After he had delivered the baby 1 surgeon discovered that he had enucleated the entire uterus with the exception of a small piece of cervix. Marvelously the patient lived and was able to resume her occupation. In 1 case Hitter of London, opened the posterior cul-de-sac, delivered the baby with Elliott forceps, and nine days later pulled away the placenta. The patient recovered. Nevertheless, it is much safer to open the abdomen for the delivery.

If the abdominal pregnancy has escaped diagnosis and the fetus is dead, the fetus may mummify or become calcified or the fetus and sac may become infected. In several of the cases reviewed all 3 of these changes occurred. Several patients became pregnant in the uterus and were delivered following abdominal pregnancy. One patient dis-

charged the contents of the fetal sac through the abdomen, another through the rectum, and a third through the urinary bladder. Theoretically the sac may rupture into any viscera, but apparently it ruptures most often through the colon.

The suggestion has been made that operation should be delayed until the death of the fetus, when the blood supply of the placenta will be shut off. Of the 37 reviewed cases in which the fetus died during the eighth or ninth month, 12 mothers died following operation and 1 died undelivered. The cause of death was hemorrhage in 6 peritonitis in 2 ileus in 2 sepsis following removal of an infected fetal sac in 1 and an unknown condition in 1. The mortality was about 33 per cent. We would therefore question the advisability of awaiting the death of the fetus before operating.

The mortality statistics given in Table XIX show definite evidence of the advantage of removing the placenta *in toto*. The factors requiring further analysis of the statistics are the preoperative manipulations and treatment. In 1 case a bag inserted through the cervix into the peritoneal cavity initiated shock and peritonitis which caused death after removal of the placenta *in toto*.

The mortality in the 236 cases analyzed by us was 24.3 per cent. The 20.3 per cent mortality in cases in which the placenta was removed *in toto* compares favorably with the mortality of 21.4 per cent in cases treated with marsupialization and the mortality of 20 per cent in those treated without marsupialization.

The question of the optimum time to operate for the safety of the mother and for a viable child may be considered. Since the site of the placenta cannot be determined clinically and since separation, rupture of the sac, and injury and infection of the placenta and sac are possible, the conclusion is drawn from experience and an analysis of the literature that operation is indicated as soon as the diagnosis is made. The delay necessary to obtain a viable child does not seem justified in the face of the danger to the mother and the high fetal mortality and deformities resulting from this form of pregnancy. According to Beck, the best time to operate is the thirty-eighth week, and this period may be awaited if the patient is under observation.

CONCLUSIONS

1. The diagnosis of advanced extra-uterine or abdominal pregnancy is warranted by a history of pain in the lower abdomen throughout pregnancy with or without irregular vaginal bleeding; a transverse or high position of the baby; absence of uterine contractions; impalpable round ligaments and an empty uterus.

2 X ray examination of the abdomen with the use of lipiodol and exploration of the uterine cavity with sounds may be confirmatory aids.

3 The proper preparation of the patient is essential to combat hemorrhage

4. Operation is indicated as soon as the diagnosis of abdominal pregnancy is made, since many children of such pregnancies die early or have deformities and the life of the mother is jeopardized less by immediate than by delayed operation.

5 Removal of the placenta *in toto* is best when the placental blood supply can be ligated and the site of the placenta is not a vital organ

6 Drainage—preferably abdominal—should be used as packing for hemorrhage or infection only when necessary. Also when necessary, marsupialization should be combined with drainage.

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ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Pearcock, S. C.: Dry Gangrene of the Face with Mummification and Separation en Bloc of the Nose and Adjacent Tissues. *Am J Dis Child.*, 1933 xlv 815

The author reports in detail a case of dry gangrene of the face in a child eighteen months of age. Eight days after a simple mastoid operation in which some sterile pus was evacuated there developed in the pharynx a mass which was assumed to be a retropharyngeal abscess. Four days later the tissues of the upper lip, the nose, and both maxillary regions below the eyes were swollen and bluish black, apparently from a hemorrhage into these soft tissues.

One week after the onset, definite separation of the margins of the necrotic tissues was first noted. This slowly progressed, and within four weeks from the beginning of the process the entire nose, together with the contiguous soft parts as well as the denser tissues covering part of the maxilla, sloughed out en masse as a cast, carrying away the left central incisor tooth and the gum surrounding the other incisor.

The exfoliation caused a shoe-shaped depression measuring about 12 by 7 cm. and containing an oval partitioned cavity measuring 3 by 3 cm. which was overlaid by a dirty-gray exudate and from which the turbinate bones projected. The exfoliated specimen weighed 13 gm. and measured 8.5 by 4 by 1.9 cm.

Pathological examination demonstrated complete infarction of the tissues. There was considerable healing with distortion of the tissues about the mouth.

Five months after the onset, an attempt at plastic repair with Wolfe grafts was made, but after the second operation the child died suddenly apparently from an embolus. Permission for autopsy could not be obtained.

This is a very rare condition. The patient, the youngest on record, had neither a cardiac, syphilitic, nor diabetic condition. The source of the septic infarction was evidently the throat abscess. It may be assumed that septic emboli were discharged from thrombi in the pharyngeal arteries and set up foci where they lodged. The occlusion of the circulation in the area of gangrene may have been due to extension of the thrombotic process through the anastomotic branches of the right and left palatine and tonsillar arteries derived from the external maxillary arteries.

CLARENCE C. RICH, M.D.

Kazanjian V. H.: The Surgical Treatment of Mandibular Prognathism. *Internat J Orthodontia Oral Surg & Radiography* 1933 xviii.

Orthodontic correction of mandibular prognathism has probably been one of the most disputed problems of orthodontia. Undoubtedly many brilliantly successful results have been obtained by the use of the usual method of regulating the teeth. In extreme cases of prognathism, however surgical interference seems to be becoming more common. In 1898, Angle stated that in certain cases of pronounced overdevelopment of the mandible no operation dependent upon tooth movement alone can establish proper relations of the teeth or materially improve the facial lines. In 1848 Hurler performed one of the first operations on an elongated jaw with prognathism. Since then operations for shortening the mandible have been done in increasing numbers by Blair, Ballin, Babcock, Pichler, Willett, and many others. In general, these operations have been accomplished by two methods.

The first method consists in removing a section of the body of the mandible on each side thus practically creating a double mandibular fracture, and immobilizing the segments until union is complete (Blair, Ballin).

The second method consists in cutting the ramus on each side above the level of the mandibular canal and then pushing the mandible back to the desired position and immobilizing it until healing is complete (Pichler, Babcock).

The author reports five cases in which double resections were done, and supplements the case histories with photographs. In all of these cases the results were excellent but one of the patients is still under treatment.

On the study models the location of the operation was determined as about the mandibular first molar region.

In addition to the preliminary work with models, specific mandibular teeth were removed at least a month before the operation. If this step is left until a later date the healing process will undoubtedly be considerably delayed. The next step was the construction of splints.

An incision about 1 in. long was made along the lower borders of the mandible. The bone was exposed and separated from its periosteum on the buccal as well as on the lingual side. The operative exposure was extended to the buccal cavity and sectioning of the bone was done with a Gigli saw. In order to have good control of the direction of the saw, a curved serrated hemostat bent approxi-

mately to the contour of the mandible, was clamped to the bone and the Gigli saw was introduced distally to the clamp. As one line was cut, the clamp was shifted forward according to the measurements and the sectioning was repeated.

As soon as the sectioning had been completed, the hooked wire of the splint was introduced and the parts were fastened together. In addition, intermaxillary elastics were applied to the maxillary and mandibular splints. Wire suturing at the lower border of the mandible was discarded as it seemed unnecessary and undoubtedly caused irritation.

During the healing of the bone, it was necessary to adjust the splint from time to time in order to improve the occlusion of the teeth.

One of the arguments advanced against this type of operation is that sound teeth are sacrificed. Another is that the exposure of the oral cavity invites infection. Judging from the cases operated on and from clinical observations of compound fractures, this possibility need not be considered a contra-indication.

JAMES BURRITT BROWN, M.D.

EYE

Radov, A.: Traumatic Epithelial Cysts Within the Eye. *Arch. Ophth.* 1933, ix, 391

Radov reviews the literature on traumatic epithelial cysts in the eye and reports a case of scleral cyst in which, at the time of enucleation, the cyst cavity was much larger than the globe.

He states that in the repair of any corneal wound either accidental or operative, epithelium invades the corneal tissue in the shape of a cone. Cysts result from pinching off of the apex of the cone. This may occur from either the anterior or the posterior surface of the cornea. Implantation of epithelial tissue with cyst formation may occur also in the iris. As scleral tissue does not constitute a good medium for the growth of epithelium, scleral cysts are less frequent. SAMUEL A. DODD, M.D.

Kraebel, C. J., and Stout, A. P.: "Orbital Inclusion" Cysts and Cysto-Adenomas of the Parotid Salivary Glands. *Arch. Surg.* 1933, xvi, 485

Cystic growths occurring in the parotid gland are lined with stratified epithelium, usually of the cylindrical type, and rest on a base of lymphoid tissue. The lymphoid tissue is generally hyperplastic and its growth makes the lining appear papillated or, if it is extreme, fills the whole cyst with epithelioid lymphoid nodules. In the latter case the epithelium generally proliferates and forms small acini, and the growth assumes the pattern of a cystic adenoma. Sometimes the cysts are multiple. The epithelium may be dilated.

The cysts have been found in persons ranging in age from twelve to seventy-four years. They are twice as frequent in men as in women, and are usually situated in the lower pole of the gland.

In the absence of infection the symptoms are usually limited to swelling and occasional twinges

of pain. Infection may lead to the formation of persistent sinuses. Removal of the cyst and all its lining will effect a cure.

Many theories have been advanced to explain the origin of these cysts. The authors believe that the orbital inclusion which gives rise to the orbital salivary gland in some of the carnivora and appears as a vestigial rudiment in human embryos is a satisfactory explanation for the cysts.

In man, the orbital inclusion is a vestigial closed tubular structure lined with ectodermal epithelium which lies in contact with the lower portion of the parotid gland. It is well known that closed tubular vestiges in other parts of the body may form cysts in adult life. Weishaaupt recorded microscopic cystic dilatation of one of the orbital inclusions which she studied. It is logical to assume that the origin of the lympho-epithelial cysts of the mature parotid gland is a dilatation and proliferation of the orbital inclusion. SAMUEL KARY, M.D.

EAR

Shambaugh, G. E., Jr.: Progressive Deafness Occurring in Identical Twins; with a Discussion of the Factor of Heredity in the Etiology of Deafness. *Arch. Otolaryngol.* 1933, xvii, 171

Shambaugh is of the opinion that heredity is the most important factor in the etiology of profound deafness, whether this condition occurs in children or is the result of otosclerosis in adult life. He states that as no two persons pass through life with identical experiences and as in identical twins the hereditary factor is exactly the same, a study of otosclerosis in identical twins might disclose the relative importance of heredity in this condition and perhaps throw some light on other causes. It seems probable that when otosclerosis develops in one of a pair of identical twins and not in the other a careful search into the experience of the two persons might bring to light facts which will point to an activating cause of the disease. If, on the other hand, the occurrence of otosclerosis in identical twins is always the same, no matter what the individual experiences of the two may be this fact would indicate that heredity is the all-important factor in the etiology of the condition.

JAMES C. BRANFELL, M.D.

Rodin, F. H.: Identical Hearing Defect in Identical Twins. *Arch. Otolaryngol.*, 1933, xvii, 79.

Rodin reports the cases of two young girls, identical twin sisters, with identical loss of hearing. In both, functional hearing tests showed practically the same loss of hearing for air conduction. Weber's test was not localized and Rinne's test was negative. The audiograms were practically identical.

Because of the insidious onset of the deafness without apparent cause, the negative Rinne test, and the normal condition of the tympanic membranes, a diagnosis of otosclerosis was made.

JAMES C. BRANFELL, M.D.

Davenport, C. B., Milles, B. L. and Frink, L. B.: The Genetic Factor in Otosclerosis. I. Problem. Methods of Study and Results. II. Detailed Description of the Various Matings and Their Progeny. III. General. *Arch. Otolaryngol.* 1933 xvii, 135-340, 593.

The authors state that about 0.2 per cent of the white population of the United States is otosclerotic. In certain fraternities 100 per cent are otosclerotic. It is thus obvious that inheritance is a factor.

The petrous portion of the temporal bone, which contains the otic capsule, has a particularly complicated embryological history. Therefore any disturbances or imbalance of the osteogenic function is especially apt to affect the otic capsule.

The beginnings of deafness are first noticed in otosclerotic persons between the ages of four and fifty-five years. Persons in the older age group are commonly but not always with justification, suspected to have progressive labyrinthine disease.

The original data of this article were obtained in part by house-to-house visits of trained eugenic field workers who gave auditory tests, and in part by correspondence.

Sixty new families were studied and the distribution of otosclerosis in them was analyzed to determine the law of inheritance.

Approximately twice as many females as males are affected with otosclerosis, but other types of difficulty in hearing occur with equal frequency in both sexes.

In body build, otosclerotic persons do not differ significantly from non-otosclerotic siblings of the same sex except that, in the relation of pelvic breadth to shoulder breadth and in chest girth, otosclerotic females seem to be more slender than their sisters.

When both parents are otosclerotic, nearly all of their daughters are otosclerotic or have difficulty of hearing of some type (one exception in a case from the literature) and about two-thirds of their sons are otosclerotic.

When only the mother is affected the proportion of affected sons and daughters is about the same.

When only the father is affected the daughters are affected about 50 per cent more frequently than the sons.

When neither parent is affected and some of the children are affected the offspring of both sexes are equally affected.

Of ten hypotheses based on these data, the most satisfactory is that otosclerosis develops under external conditions which favor it whenever the patient has a constitution that combines two dominant factors viz. a factor λ , which lies in the sex chromosome, and a factor A which lies in one of the autosomes.

According to this hypothesis, the female sygote has the same half chance as the male of getting an λ -chromosome from the egg; the other half has received an affected λ -chromosome from the sperm. Hence, we should expect twice as many sygotes carrying an affected λ -chromosome in the females as in the males. This agrees closely with observation.

It is suggested that the autosomal gene modifies the reaction of the mesenchyme and especially the osteoclasts and osteoblasts. The sex-linked gene acts differentially between the sexes, possibly affecting calcium metabolism.

The evidence that otosclerotic persons belong to a degenerative class (Bauer and Stein) seems inadequate. However such persons occasionally have defects in the mesenchyme elsewhere than in the otic capsule which lead to exostoses, brittleness of the bones, and blue sclerotics.

The evidence that otosclerosis labyrinthine difficulty in hearing, and deafmutism have the same genetic basis is not adequate but overlapping of the conditions may occur. JAMES C. BRASWELL, M.D.

Coleman, C. C. and Lyerly, J. G.: Ménière's Disease. Diagnosis and Treatment. *Arch. Neurol. & Psychiat.*, 1933 xxix, 522.

The authors report ten cases of intracranial section of the eighth nerve for the relief of Ménière's disease. In the majority the operation was done under local anesthesia. In all, it was followed by prompt recovery. The results compare favorably with those following modern operations for the relief of major trigeminal neuralgia. None of the patients suffered from vertigo after the operation. While some of them showed a slight unsteadiness, this was not disabling and decreased in time. Tinnitus decreased in every case.

The authors conclude that intracranial section of the eighth nerve is very successful in relieving the disability of Ménière's disease. GEORGE R. MCAULIFF, M.D.

Smith, A. B.: The Development of the Mastoid Air Cells. *J. Laryngol. & Otol.* 1933 xiviii, 225.

From a histological examination of twenty temporal bones of children ranging in age from birth to ten and a half years the author concludes that the mastoid air cells are formed by (1) resorption of the bony walls of the mastoid antrum by osteoclasts, (2) penetration of the subepithelial connective tissue into the spaces hollowed out by these multinucleated cells, (3) replacement of the bone marrow by this tissue, (4) degeneration and absorption of the central part of the connective tissue followed by its condensation as a thin layer on the surface of the bone, and (5) proliferation of the epithelium which follows the regression of the connective tissue and remains in contact with it. He believes that the maxillary air cavity develops in a similar manner.

GEORGE R. MCAULIFF, M.D.

NOSES AND SINUSES

Schall, LeR. A.: The Histology and Chronic Inflammation of the Nasal Mucous Membrane. *Ann. Otol., Rhinol. & Laryngol.*, 1933 xiii, 15.

Mucous membrane includes a surface epithelium, a basement membrane and a tunica propria, and

sometimes, in addition, a muscle coat and submucosa. The cell type may be of any of the epithelial varieties, and the arrangement may be either stratified or pseudo-stratified.

Of the cellular elements, the lymphocytes predominate. These may be scattered throughout the tissue or collected in one mass to form a lymph node. The glands vary from the simple straight tubule lined with goblet cells to the tubo-alveolar type. Blood is supplied by vessels which enter deep in the stroma. The venous return occurs by way of superficial blood spaces which lead to a deeper venous plexus, sometimes forming cavernous sinuses. Such is the general picture of a normal mucous membrane.

The nasal mucosa shows variations according to site. In the infant the septum shows the pseudo-stratified ciliated variety. In the adult, this is changed to the stratified squamous variety with an abundance of mucous and serous glands and, in the region of the tubercle large blood lakes. The epithelium of the olfactory portion is of the stratified variety, the surface cells being both sustentacular and olfactory.

The covering of the turbinates varies a great deal in thickness. The epithelium is frequently of the low cuboidal type. There is an abundance of glands, especially over the middle turbinate, and the perosteum is firmly adherent. The inferior turbinate shows pronounced blood channels.

In the maxillary antrum the mucosa is thin and delicate and contains numerous goblet cells. Glands are few; they are most numerous in the region of the ostium. The ethmoidal mucosa shows similar characteristics, but its perosteum is more adherent. The mucosa of the sphenoid and frontal sinuses is also similar.

Pathologically chronic inflammations of the nasal mucosa are classified as edematous, infiltrative, fibroid, cystic, and degenerative.

In the edematous type the swelling is most marked in the superficial portion of the stroma, the vessel walls are thickened, and the glands are dilated.

In the infiltrative type there is a predominance of lymphocytes. The infiltration is particularly marked about the glands and sometimes may be so dense as to suggest lymph nodules. The glands are exceedingly numerous, and the blood vessels are thickened.

In fibrotic inflammation the chief characteristic is fibrosis. There is a decrease in the cellular elements with a marked increase in the fibrous tissue.

In the cystic mucous membrane there are multiple small cysts. True degenerative changes in the mucosa are rare, the epithelial cells not being easily destroyed.

Nasal polypi are considered overgrowths of tissue normal to the region in which they occur and show changes characteristic of mucosa in general. Accordingly there are edematous, fibrous, and cystic types, and combinations of these types.

The turbinate mucosa is subject to the same changes as mucosa elsewhere. Hypertrophy may be

physiological as well as pathological.

JOHN F. DILLON, M.D.

Hilding, A.: Experimental Surgery of the Nose and Sinuses. II. Gross Results Following Removal of the Intermaxillary Septum and of Strips of Mucous Membrane from the Frontal Sinus of the Dog. *Arch. Otolaryngol.*, 1933, xvii, 337.

Twenty-four strips of mucous membrane were removed from one or both frontal sinuses of fifteen dogs and the denuded area was observed at subsequent operations after periods of time varying from one day to thirty-six weeks. Each denuded area was observed from one to five times after the denudation.

All of the operations were done under ether anesthesia and with an aseptic technique. The ether was administered through a tracheal tube. The frontal bone was laid bare over both frontal sinuses through an incision in the median line, and the bony roofs of both sinuses, including the corresponding mucous membrane, were removed at the first operation by means of the chisel, mallet, and rongeur. The strips of mucous membrane to be removed were outlined by an incision made with a small, sharp scalpel and then removed by means of a small ethmoidal curette or a bit of gauze held in the jaws of a small hemostat. In all but five of the animals the removal of the strips resulted in high, sharp scars. In general, the wider the strip removed the higher and thicker was the resulting scar.

The author believes that the following conclusions may be drawn from these experiments, at least so far as the normal frontal sinus of the dog is concerned:

1. High ridges and diaphragms of scar tissue follow the removal of strips of mucous membrane on concave surfaces.
2. These ridges and diaphragms interfere with normal drainage, and if they are so situated that the mucus cannot readily slide around them they cause the mucus to collect in pools.
3. When a complete ring of mucous membrane is removed from the interior of the sinus in any plane, with division of the remaining mucous membrane into halves, the circular scar that forms in healing may become a complete diaphragm of connective tissue dividing the sinus into two cavities. Under such circumstances one of the cavities subsequently becomes filled with mucus.
4. Partitions or septa between sinuses can be removed and the resulting opening can be kept patent if the edges of the mucous membrane on both sides of the partition are made to meet and no strip of bone is left bare.
5. If at the end of the operation a bare strip of bone circles the opening, healing usually forms a diaphragm which as a rule closes the operative opening and makes the partition or septum once more intact.
6. The ostium can be closed by removing a circular strip of mucous membrane from around it.

Mosher H. P. and Judd D. K.: An Analysis of Seven Cases of Osteomyelitis of the Frontal Bone Complicating Frontal Sinusitis. *Laryngoscope* 1933, XLIII, 153

The authors state that in osteomyelitis complicating infection of the frontal sinus edema of the skin and soft tissues of the forehead is the first sign of infection of the medulla of the bone and periosteum. The infection of the myeloid tissue of the bone and of the periosteum occur at the same time and advance together. The edema of the skin of the forehead is a practical guide to the extent of bone to be removed. This has been proved by the microscopic examination of surgically removed bone specimens.

At operation two large triangular skin flaps give the best exposure and the best drainage. The bone removal should be begun beyond the edema, generally at or near the hairline and should be carried downward from normal bone to diseased bone.

Röntgen-ray examination does not give positive findings until necrosis occurs. Therefore it is not positive until from seven to ten days after the edema has shown infection of the medulla, when the infection of the medulla of the bone has extended from 1 to 2 in. beyond the necrotic area. Radical operation—multiple radical operations if necessary—offers the best chance of success.

JAMES C. BRASWELL, M.D.

MOUTH

Lund, C. C. and Holton H. M.: Carcinoma of the Buccal Mucosa. End Results 1918-1926. *New England J Med* 1933, CXXVII, 775

The authors review the end-results in 126 cases of carcinoma of the mouth which were treated at the Collis P. Huntington Memorial Hospital, Boston, in the period from 1918 to 1926 inclusive. They have classified the cases into 2 groups: a small gland group and a "large" gland group. The former included all cases in which the glands of the neck were not palpable or did not exceed 1 cm. in diameter and the latter included all others. The authors regard as cured the cases in which the patient was free from local or distant recurrence or metastases five years after the treatment was discontinued.

Of 155 primary cases with small glands which were treated by surgery a cure was obtained in 37 (24 per cent) whereas of 341 similar cases which were treated with radium, a cure was obtained in only 13 (4 per cent). However in the period from 1918 to 1926 the irradiation treatments were inadequate according to our present conceptions. In the cases in which the original lesion did not exceed 1 cm. in diameter the incidence of cure from the use of radium alone was 39 per cent, but in the cases of larger lesions it was much lower. Of the cases with small primary lesions which were treated by surgery alone a cure was obtained in 50 per cent. Of 33

cases of small glands which were treated by surgery combined with irradiation a cure was obtained in 4 (17 per cent).

In the "large" gland group there were 304 cases. In the cases which were treated by surgery alone or by combined surgery and irradiation, no cures were obtained, and of 281 cases treated by irradiation alone, a cure was obtained in only 1. In cases of recurrent carcinoma following surgery or irradiation or both, the incidence of cure was less than 3 per cent.

The authors' statistics with regard to radical versus local surgery show no great weight of evidence that the radical operation cures many cases that would not have been cured by a well performed local operation.

WILLIAM G. HASOM, M.D.

Fischel, E.: The Surgical Treatment of Metastases to Cervical Lymph Nodes from Intra-Oral Cancer. *Am J Roentgenol* 1933, XXIX, 337

Fischel states that any treatment of metastatic lymph nodes must aim at local obliteration of the foci of the disease. This can be accomplished by surgery, external irradiation, or interstitial irradiation. The use of external irradiation is limited as metastases from squamous-cell cancer of the mouth are very radioresistant. The resulting fibrosis is of doubtful value. Interstitial irradiation is a more direct attack, but because of the complicated anatomy of the neck, destruction of all of the cells of metastases must be regarded as accidental.

While even the most radical surgery cannot always remove all of the metastases of an intra-oral cancer the paths of spread are well known and can be so thoroughly excised that recurrences in the operative field can be rendered very rare. The neck can be thoroughly cleared of lymph vessels and glands without greatly handicapping the patient. The radical operation gives the best results before there is demonstrable (i. e. microscopic) cancer in the lymph glands.

In the radical operation it is necessary to remove considerable tissue beyond the involved area and to begin the excision at the periphery of tissue to be excised and end it at the point of maximum involvement. There are only 4 inviolate structures in the triangles of the neck—the 2 common carotid arteries and the 2 vagus nerves. Both jugular veins may be removed at different stages and even 1 vagus nerve may be severed. The degree of post-operative shock is governed by the time consumed and the amount of blood lost in the operation. The most feared complication is postoperative hemorrhage. The best preventive of this complication is closure with ample drainage. Contra-indications to surgery are: (1) a poor general condition, (2) evidence of metastases below the clavicle, (3) fixation of the metastatic mass to the spinal column, and (4) extensive skin invasion.

Of 190 cases treated in the Barnard Free Skin and Cancer Hospital, St. Louis, a five-year cure was obtained in 81 per cent of those without

demonstrable involvement of glands and in 35 per cent of those with demonstrable involvement of glands. Exclusive of cases of cancer of the lip a five-year cure was obtained in 63 per cent of cases in which the glands showed simple hyperplasia and in 35 per cent of those in which the excised gland showed metastasis. In 50 private cases the corresponding incidence of five year cure was 100 per cent and 37 per cent.

In the clinic cases the operative mortality was 21 per cent, but 36 of the 39 patients who died had an intra-oral operation combined with neck dissection. In 51 clinic cases and 55 private cases in which the neck dissection was postponed until the primary lesion had healed the operative mortality was 5.7 and 3.6 per cent respectively.

CLARENCE C. REED, M.D.

Gillies, Sir H., and Kilmer, T. P.: Harelip: Operations for the Correction of Secondary Deformities. *Lancet*, 1933 cccxiii, 1969.

The original deformities of the nose and lip are often so complex that it is unreasonable to expect the primary operation, undertaken as it usually is at a very early age, to accomplish more than aseptic closure with simple adjustment. This produces a sound basis for future work of a more cosmetic nature.

The most common contour deformity seen in old cases of harelip and cleft palate is produced by flatness of the lip and depression of the nose. The flat lip is most marked when the premaxilla has been removed.

The nasal deformity is said to be dependent on the following factors: (1) backward displacement of the maxilla resulting from the scar tissue pull which follows successful closure of the palatal cleft; (2) definite under-development of the normal amount of bone in the parts of the maxilla which border on the pyriform opening; (3) the backward pressure of a tight lip; and (4) definite failure in the forward growth of the nasal septum. As the result of backward displacement of the maxilla the upper teeth usually come to lie well inside those of the lower jaw. Mastication is then inefficient and the lower lip is rendered abnormally prominent.

The operative procedure that will be found most widely applicable to this type of lip and nose has been called the "buccal inlay." It consists in the introduction of a Thiersch graft on a mould designed to free the lip and nose from the underlying retroposed maxilla. Freeing and loosening of the lip in this way allows the wearing of an upper denture sufficiently prominent to produce a normal contour and carrying, well in advance of the natural position, artificial teeth which articulate normally with the lower teeth.

The results of this simple procedure are said to be remarkable. The whole character of the face is improved and final successful operations on the lip and nose are rendered possible and are more easily accomplished.

In cases of double harelip the so-called probolium is often placed so far down the lip that the lobule of the nose is dragged down with it.

The mucous membrane of the premaxilla, having failed to unite with the mucous membrane of the advancing lateral processes, forms a pseudo-vermillion border for the probolium, and this has tempted many a surgeon to utilize it in the construction of the new lip margin, to the permanent detriment of the patient.

The variability in the size of the probolium appears to lend weight to the opinion that there is in all cases of cleft lip and palate a varying degree of non-development of tissue rather than merely a non-union of normally developed parts. From the point of view of a plastic operation on the lip it is imperative in all cases of down-drawn nose tip to take the probolial skin out of the lip and suture it sufficiently high on the free border of the septum to allow the tip of the nose to come forward and upward into normal position.

A very pleasing non-surgical type of lip may be obtained by performing what the author has called the "Cupid's bow" operation. In principle this consists in discarding altogether the existing skin-vermillion junction and making a new curved lip border at a higher level. The result is an attractive short lip with full mucous membrane and at least a suggestion of a Cupid's bow.

In a few cases there has been so much surgical and developmental loss of tissue that nothing short of the grafting of a whole-thickness flap from the lower lip (Abbe's operation) is likely to result in any striking improvement.

Procedures for the correction of the nasal deformities are described and shown by illustrations.

JAMES BARRETT BROWN, M.D.

Levi, D.: An Advance in the Surgery of Cleft Palate. *Lancet* 1933, cccxiv 515.

The author says that Langenbeck's operation described in 1861 does not give uniformly good results but is still used by many English surgeons. The functional results are often poor and the palate frequently breaks down. Veau's operation constitutes an improvement in cleft palate surgery. It includes suture of the nasal mucosa, of the muscles of the soft palate, and of the buccal mucosa. The palate is repaired when the patient is about one year old. About two months before the operation the tonsils and adenoids are removed.

Operation for cleft soft palate. Before any sutures are introduced the edges of the soft palate and uvula are incised rather than pared so that all tissues are conserved. The muscular elements are then detached from the hard palate. In suturing the nasal mucosa the author uses ophthalmic silk worm gut and a Reverdin needle. The sutures are tied on the nasal side, with care to avoid lifting the soft palate. The nasal sutures are carried back to the base of the uvula. The uvula is then closed on the anterior surface.

The most important step in the operation is the muscular suture. The palatal muscles are enveloped with catgut sutures with the use of a Reverdin needle which is passed between these muscles and the nasal mucosa. Only the musculature of the palate is included. These sutures are pulled tight and tied. The mucosal and buccal sutures are then placed.

Operation for clefts of the hard and soft palate
This operation is carried out in a manner similar to that for cleft of the soft palate alone. The incisions in the edges of the soft palate are carried up to the cleft in the hard palate. Before the edges of the mucosa are incised the mucosa is separated from the hard palate with the crochet rugine. The mucosa is detached from both nasal and buccal surfaces. When the edges of the cleft have been incised and the nasal mucosa has been elevated the cut edges of the mucosa overlap the edge of the bone by 2 or 3 mm. The sutures in the nasal mucosa, usually four are placed so that the ends can be left long and used later to close the palatal flaps.

Next an incision is made around the alveolar margin near the teeth from a point just posterior to the alveolar process of the superior maxilla to a point external to the posterior palatine foramen on both sides. The flap is raised with care not to injure the blood supply from the palatine artery. Bleeding is controlled by pressure. The flaps are placed in position by the four untied sutures which have been passed through the nasal mucosa and all are placed before any of the sutures are tied. The palatal flaps are then sutured in the midline.

A small gap is of no importance.

So far the author's patients have been so young that it has been impossible to judge the functional results of the procedure. CLARENCE C. REED M D

PHARYNX

Alcalay B: Histological Studies in Cases of Hemorrhage Following Tonsillectomy (Examen histologiques dans les hémorragies consécutives à l'ablation des amygdales) *Otolaryngol. 1933* iv 129

Among the general factors predisposing to hemorrhage after tonsillectomy are hemophilia, leukemia, hemorrhagic diathesis, menstruation, and arteriosclerosis. By some surgeons particular importance has been attached also to an anomalous course of the blood vessels supplying the tonsil. The most common sites of hemorrhage are the superior pole and the hilum.

There has been very little study of the relation of different pathological conditions of the tonsils to the occurrence of hemorrhage after tonsillectomy. It has been claimed and disputed that the tendency of the tonsillar artery to bleed after removal of the tonsils is increased when the artery runs through fibrous tissue. It has been observed that bleeding is more common after intracapsular tonsillectomy than after extracapsular tonsillectomy.

The author reports a histopathological study of the tonsils in seven cases in which tonsillectomy was followed by quite severe hemorrhage. In all of these cases there was a history of repeated throat infection. The significant constant finding of histological examination was a hyaline degeneration of the walls of the blood vessels running through the chronically inflamed tissues. In most of the cases the hemorrhage resulted from failure of the cut vessels to contract sufficiently not because they were surrounded by scar tissue but because their own walls had undergone degenerative changes from the insults of the chronic inflammation. This finding explains why extracapsular tonsillectomy is less apt to be followed by bleeding than intracapsular tonsillectomy in cases of chronic inflammation, and suggests that postoperative hemorrhage might be prevented by the excision of all capsular tissues about the tonsils. GAYLORD S. BATES M D

Sawers W C. and Barrett F R: A Bacteriological Investigation of a Series of Tonsils Removed by Operation *Med J Australia* 1933 i, 304

The authors made a bacteriological examination of the surfaces and crypts of diseased tonsils in children. One hundred and seventy pairs of tonsils were examined. The usual bacteria were found, but in 70 per cent hemolytic streptococci predominated on the surface and in the crypts. No acid fast bacilli were discovered. The authors state that the bacterial flora on the surface of the tonsil does not appear to be a reliable index of the flora in the crypts.

GEORGE R. McAVITT M D

NECK

Rowe, A W: Endocrine Studies XXXV The Association of Hepatic Dysfunction with Thyroid Failure. *Endocrinology* 1933 xvii, 1

Rowe finds that 22.44 per cent of all patients with thyroid failure have a hepatic complication whereas only 10.91 per cent of those with other endocrine or non-endocrine disturbances have such a complication. As a combination of thyroid and hepatic failure might suggest some other morbid condition, he analyzed data from 100 cases of thyroid and liver disturbances and 100 cases of uncomplicated liver disturbances.

He found no significant difference in the incidence of focal infection in the 2 groups. The incidence of cancer and goiter in the family history was considerably higher in the cases of thyroid and liver disturbances than in those of uncomplicated liver disturbances. Of the suggestive chief complaints, vertigo and fatigue were more frequent in the former and headache and abdominal pain were more frequent in the latter. Menstrual irregularities were more frequent in the cases of thyroid and liver disturbances. In these cases also difficulties in conception and delivery were somewhat greater than in cases of uncomplicated liver disturbances, but significantly less than in cases of uncomplicated

thyroid disturbances. Of the patients with thyroid and liver disturbances, twice as many were overweight as of those with uncomplicated liver disturbances. Of the latter, a little over half were within the normal weight limits. About one-quarter of both groups were underweight. Half of the patients with thyroid and liver disturbances and three-quarters of those with uncomplicated liver disturbances had albuminuria. The incidence of glycosuria was twice as high in the cases of uncomplicated liver disturbances as in those of thyroid and liver disturbances.

Chemical examination of the blood showed nothing important except that the uric acid was slightly above the normal in both groups. The red cell count and haemoglobin showed a mild secondary anemia in both groups. A slightly higher leucocyte count in the cases of uncomplicated liver disturbance was probably due to the commonly associated mild cholecystitis. Eosinophilia is definitely a sign of liver disturbance as it was not found in cases of

uncomplicated thyroid failure. All of the patients with thyroid disturbances and one quarter of those with liver disturbances showed a depressed basal metabolic rate. The blood pressure was on the same level in both groups. Fewer than 10 per cent of the patients in each group showed hypertension, but Rowe suggests that the mechanism of the blood pressure level was different in the 2 groups. He believes that the depression of the pulse, respiratory rate, and temperature in the cases of thyroid and liver disturbances was due to the thyroid component. The galactose test showed a considerable depression in both groups, but this was more striking in the cases of uncomplicated liver disturbances than in those of thyroid and liver disturbances.

In conclusion Rowe says that as combined thyroid and liver dysfunction frequently stimulates pituitary or secondary ovarian failure, investigation of liver function will furnish important evidence in the differentiation of the various endocrinopathies.

F. S. Moxam, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS CRANIAL NERVES

Gurdjian, E. S.: *Studies on Acute Cranial and Intracranial Injuries. Ann. Surg.* 1933 xcvi, 347

From an analysis of the literature and of his cases Gurdjian has compiled the following classification of head injuries.

- 1 Fracture of the skull, simple.
- 2 Fracture of the skull, simple, depressed.
- 3 Fracture of the skull, compound
4. Intracranial hemorrhage.
 - A. Extradural due to rupture of meningeal vessels, sinuses and diploë.
 - B. Intradural due to pial tears, bruises, or laceration of nervous tissue.
 - (1) Subarachnoid.
 - a. Generalized.
 - b. Localized.
 - (2) Intraparenchymatous.
 - a. Petechial.
 - b. Massive.
- 5 Bruising or laceration of nervous tissue, with or without fracture of the skull.
- 6 Increased intracranial pressure.
 - A. Caused by any of the above.
 - B. With no demonstrable pathological lesions in the brain.
- 7 Complications.
 - A. Meningitis.
 - B. Meningo-encephalitis.
 - C. Brain abscess.
 - D. Pneumocephalus.

Among 718 cases of head injury brought to the Detroit Receiving Hospital, there were 475 cases of skull fracture proved by autopsy, X ray examination, and inspection. The mortality in the entire series was about 19 per cent and in those with demonstrated fractures about 25 per cent. Extensive lacerations of the brain associated severe injuries elsewhere in the body fractures in the posterior fossa, and injuries with associated nasal and aural bleeding were among the factors that increased the mortality.

Convulsions occurred in 6 per cent of the cases. In half there were Jacksonian spells. In a smaller number there were generalized epileptiform attacks. Five patients had attacks of the decerebrate rigidity type. All 5 died. Convulsions do not necessarily indicate operative treatment. In the absence of corroborative findings of hemorrhage the author treats cases of convulsions conservatively or by lumbar puncture. Many patients with Jacksonian spells recover without operation. Catatonic states in cases of head injury suggest a left cerebral lesion and in the majority there is associated aphasia. It

is emphasized that alternating oculomotor paralysis may be caused by middle meningeal hemorrhage rather than a lesion in the mid brain involving the third nerve and the pyramidal tract on a given side. Such a picture may obtain in cases of middle meningeal hemorrhage because of pressure by the clot against the third nerve near the cavernous sinus and paralysis of the opposite half of the body by pressure against the motor cortex on the same side.

When one follows the fatal cases to the autopsy room one is impressed by the fact that in a great number the present-day method of approach whether operative or conservative is of little avail. In approximately 50 per cent of the cases reviewed by the author the patient was confined to bed the head elevated and an icebag applied. The fluid intake was restricted to approximately 1000 c.cm. per day and concentrated solutions of magnesium sulphate were given by rectum over a period of three days. All of the patients were confined to the hospital for at least twelve days. Forty per cent were given treatment to reduce the intracranial pressure i.e. the intravenous administration of a 50 per cent glucose solution and spinal drainage. About 7 per cent were subjected to operative measures.

Lumbar puncture is an important diagnostic and therapeutic procedure but its indiscriminate use is to be condemned. It is never done by the author within from six to eight hours after the injury except for diagnostic purposes. Even then it is done very carefully and always with the use of a spinal manometer. In a certain number of cases its therapeutic use is followed by truly marvellous results but the author has more faith in it for its immediate effect than as a preventive of late undesirable sequelæ.

Fifty-one of the cases reviewed were operated upon with an operative mortality of about 37.5 per cent. Compound fractures are considered emergency conditions and are operated upon as soon as the general condition permits. Asymptomatic simple depressions are not considered emergencies. They are treated conservatively and a certain number are not operated upon at all. Operation is done only after due consideration of all factors. Extradural hemorrhages are usually due to hemorrhage from the middle meningeal artery but some of them come from injuries to the lateral sinus. Commonly 1 or 2 trephine openings are made to verify the presence of the clot and then a flap operation is carried out. The results are very gratifying. In cases of subdural hemorrhage, on the other hand, the results are usually poor whether operative treatment is given or not. Subtemporal decompression is the procedure usually practiced. Gurdjian concludes with regard to operative procedures that the best policy is 'conservative watchfulness.' JOHN W. ERTON, M.D.

Barriere, A. V., and Medoc, J: Two Cases of the Syndrome of Chiasmal Tumor (Sobre dos casos de síndrome quiasmático tumoral) *Rev. oto-neuro-oftalmol.* 7 de cirurg. neural 1933 VIII, 39.

The chiasmal syndrome consists essentially of the combination of bitemporal hemianopsia with simple optic atrophy and nervous and endocrine disturbances. The authors report a case of intrasellar tumor and a case of suprasellar tumor to show the differences between them.

In the first case the tumor was a pituitary endotheloma. In the second, it was a papilliferous cyst originating from Rathke's pouch and invading the third ventricle, the hypophysis remaining normal. Both of the patients presented a typical chiasmal syndrome with identical ocular symptoms, but contrasting neurohypophyseal symptoms. The first presented acromegaly the second, adiposogenital dystrophy and the infundibular syndrome. The first patient was operated upon successfully but the second died of postoperative shock. The well-illustrated case reports include the complete clinical and roentgenological findings, the operative technique, and the pathological character of the tumors. In the report of the second case the findings of examination of the brain are also given.

The authors describe the anatomical relationships of intrasellar and suprasellar tumors. While the location of the tumor is usually not difficult to determine, the diagnosis of the nature of the tumor may be very complex, especially in cases of the heterogeneous group of suprasellar tumors. The authors give the classification and main diagnostic features of the latter. They then discuss the neurological, endocrine, and roentgenological features. Hypogenital adiposity is observed in association with both intrasellar and suprasellar tumors. The authors' second case supports the view that the causal lesion lies in the infundibulum and tuber cinereum. The roentgenoscopic signs are not in themselves decisive they must be evaluated in connection with the clinical data. In certain cases roentgenography gives information as to the nature of the tumor as areas of calcification are characteristic particularly of craniopharyngeomata.

With regard to the evaluation of the ocular disturbances in the differential diagnosis, the authors discuss the characteristics and evolution of hemianopsia, the relation of the site of the initial defect in the field to the direction of the pressure exerted by the tumor the dependence of the latter on the intrasellar or suprasellar origin of the growth the ophthalmoscopic appearances and oculomotor disturbances and the human and experimental anatomical evidence on which their conclusions are based. The earliest visual defect is in color perception. The persistence of islands of vision in the extreme temporal part of the field after the establishment of hemianopsia is characteristic especially of tumors arising above the middle of the chiasm. The beginning of the defect in one or the other temporal quadrant has been recognized as a dif-

ferential sign between compression of the lower surface of the chiasm, such as occurs in cases of pituitary tumor and compression of the upper surface such as occurs in cases of suprasellar tumor. In cases of intrasellar growths the defect almost always begins in the superior external quadrant, whereas in those of suprasellar tumor it almost always begins in the inferior external quadrant. The fluctuations of the hemianopsia and the localization of certain defects are not in accord with the usual hypothesis of direct compression of the chiasm by the tumor. They suggest rather that the pressure is exerted, not directly on the nerve fibers, but on the vessels, producing zones of ischemia.

Optic atrophy and oculomotor disturbances are late symptoms. A yellowish, waxy discoloration appearing as stripes on a normal papilla is described as peculiar to the chiasmal syndrome. Later a characteristic edema appears. Both of the authors' cases showed Wernicke's hemianopsic reaction of the pupil with blindness in one eye and temporal hemianopsia in the other. Neither case presented the paradoxical anisocoria described by Behr. In both the pupil of the blind eye was the larger.

M. E. Moss, M.D.

Schwenkenberg, A. J.: Spontaneous Subarachnoid Hemorrhage. *Texas State J. M.*, 1933 XXVII, 214.

The occurrence of hemorrhage into the subarachnoid space is now recognized more frequently than formerly. It is probable that many cases have been diagnosed as hemorrhagic encephalitis or meningitis. In some of the cases in which the cause cannot be determined the bleeding may be due to small aneurysms of the cerebral vessels resulting from a congenital defect or cerebral arteriosclerosis. Occasionally syphilis may be a factor. In some cases venous anomalies have been found.

With the exception of the occasional complaint of headache over an indefinite period the history is usually of little significance. In some of the cases reported the patient had suffered from migraine headaches for years before the hemorrhage. One of the author's patients had attacks of petit mal for several years.

The symptoms and signs are those of a sudden increase of the intracranial pressure with meningeal irritation. As a rule the onset of the hemorrhage is accompanied by sudden severe headache but occasionally it causes loss of consciousness or coma. The headache is frontal or occipital and often requires large doses of morphine for relief. The patient complains of pain behind the eyes with a feeling that the eyes are going to "pop out." There is extreme sensitiveness to light, sound, and touch. The neurological signs are those of meningeal irritation—nuchal rigidity, opisthotonos, Kernig's sign, a bilateral Babinski reaction, and an increase in the deep reflexes. Occasionally there is papilloedema with retinal hemorrhage. In some cases there are localized signs such as upper motor neuron or cranial nerve paralysis. The cranial nerves af-

affected most often are the third and sixth. Occasionally jacksonian convulsions occur, and quite frequently there are generalized convulsions.

The most constant sign is the appearance of blood in the spinal fluid. In a few days the color changes to brown, and then to yellow. After from ten to fourteen days the spinal fluid is again clear and colorless. The intracranial pressure is increased from 30 to 40 mm. Hg. The temperature may rise slightly or to 104 degrees F. There is a definite increase in the white blood cells with a relative leucocytosis.

The treatment requires complete rest, the application of an ice bag to the head, and repeated spinal punctures. The latter reduce the pressure and remove part of the blood pigment which irritates the meninges and is responsible for more discomfort than the increased intracranial pressure.

Slight exertion may cause another hemorrhage with a renewed increase in the intracranial pressure and recurrence of blood in the spinal fluid. In fatal cases death seems to be due to profuse hemorrhages.

The author reports fourteen cases.

E. S. PIATT M.D.

Wilkins H., and Sachs E.: Variations in Skin Anesthesia Following Subtotal Resection of the Posterior Root, with a Report of Twenty Six Cases Illustrating a Series of Variations. *Arch. Neurol. & Psychiat.*, 1933 xxix, 19.

Wilkins and Sachs discuss the sensory losses subsequent to subtotal resection of the posterior root of the trigeminal nerve and report twenty-six cases in detail. They believe that these cases show that a fiber or fibers may be missed in subtotal section even when the greatest care is used that there is sometimes considerable interlacing of the fibers and that adjacent nerve fibers do not always supply adjacent areas of skin. In the great majority of the cases they discovered no distinct line of cleavage between the ophthalmic fibers and fibers of other groups, and therefore found it necessary to estimate which portion of the root contained the ophthalmic fibers. In their experience, separating and leaving only the ophthalmic portion of the posterior root has not been so uniformly successful as a perusal of the literature suggests it should be.

Although in some of their cases fibers were left in areas in which pain was present, the fibers to the area in which the 'trigger zone' existed were always cut. To date, a recurrence has developed in only one of their cases, and in this instance there was some doubt as to the diagnosis. The authors conclude that some of the pain in cases of trigeminal neuralgia is referred pain.

HAILE HAVEN M.D.

Conte E.: A Case of Tumor of the Acoustic Nerve (Informe ad un caso di tumore del nervo acustico) *Radiol. med.*, 1933 xx, 121.

Tumors of the cerebellopontine angle cause direct and indirect roentgenological manifestations. The direct manifestations are caused by the pressure

of the growing neoplasm on the underlying bone. In tumors of the acoustic nerve the most important direct manifestation is Henschen's sign: dilatation of the internal acoustic meatus. This indicates the site of the tumor exactly. The chief indirect signs, which are due to internal hydrocephalus, are erosion and atrophy of the quadrilateral plate, deepening and enlargement of the sella turcica, separation of the sutures and digital impressions. The earliest and most constant signs are erosion and atrophy of the quadrilateral plate.

The author reports a case of tumor of the left acoustic nerve in which the neoplasm was verified at autopsy. X-ray studies in the classical positions (laterolateral, transorbital fronto-occipital, fronto-suboccipital, and mentovertebral) showed definite enlargement of the left acoustic meatus, erosion of the apex of the left pyramid, slight enlargement of the right acoustic meatus, and slight erosion of the right pyramid besides indirect signs of increased intracranial pressure. Studies in the oblique position of Stenvers showed erosion of the apices of both pyramids. The erosion on the right side appeared definitely greater. At autopsy it was found that the erosion of the right pyramidal apex was on the anterior surface and caused by pressure from the internal carotid artery and the superior petrosal sinus.

DAVID JOHN IMPARATO M.D.

SPINAL CORD AND ITS COVERINGS

Douglas-Wilson H., Miller S., and Watson G. W.: Spontaneous Subarachnoid Hemorrhage of Intraspinal Origin. *Brit. M. J.* 1933 i, 554.

Spontaneous subarachnoid hemorrhage of intraspinal origin is rare. It is distinguished from the more common spontaneous subarachnoid hemorrhage of cerebral origin by (1) the absence of cerebral and cranial nerve signs, (2) marked rigidity and hyperesthesia of the spinal roots and nerves, (3) rigidity of the spine with a mild degree of opisthotonos, and (4) almost instantaneous relief of the symptoms on lumbar puncture.

DAVID JOHN IMPARATO M.D.

Kischner M. and Davison, G.: Myelitic and Myelopathic Lesions. III. Arteriosclerotic and Arteritic Myelopathy. *Arch. Neurol. & Psychiat.* 1933 xxix, 703.

The authors report eight cases of myelopathic lesions secondary to circulatory interference within the cord from partial or complete occlusion of the spinal or meningeal vessels. In two of the cases the condition was due to arteriosclerosis and in six to arteritis. Syphilis was a factor in five of the six cases of arteritis and tuberculosis was a factor in one. The symptoms varied. The diagnosis may be aided by the fact that soon after the onset there are symptoms indicative of involvement of other components of the neuraxis, as in toxic myelopathy. Also of diagnostic value is the finding of clinical, serological or cytological evidences of syphilis.

In the atherosclerotic group, histopathological examination showed marked destruction of the nerve cells, myelin sheaths, and axis cylinders accompanied by dense gliosis. In the arteritic group the changes were similar except that the glial response was poor.
ROBERT ZOELLNER, M.D.

Cornill, L. and Mosinger H.: Intraspinal Angiomas and Telangiectases (Sur les angiomes et telangiectasies intrarachidiennes) *Ann. Anat. Path.*, 1932, IX, 955.

From a study of 104 cases of intraspinal angiomas and telangiectases the authors draw the following conclusions:

1. Venous, arterial, and capillary telangiectases may have a hereditary (chromosomal) or acquired origin. In the latter case the cause is rarely of a mechanical nature (compression) since as a rule, the condition seems to have an inflammatory origin. Post-inflammatory telangiectases is common in other parts of the body, especially the skin (telangiectatic cicatrices) and is particularly frequent in the region of the central nervous system. Accordingly some local tissue factors which still remain obscure must play a part in its occurrence. Without doubt, these factors are similar to those involved in syringomyelia, viz. paucity of sustaining connective tissue and interference with the drainage of extravascular and intravascular fluids.

2. In a certain number of cases angioma grafts itself on the inflammatory telangiectasis. In fact it is frequently accompanied by a veritable hyperplastic capillary process (angioma). In some cases the angioma probably becomes changed into a hyperplastic vascular tumor (angioma) by a mechanism analogous to that involved in the pathogenesis of certain reactive hyperplastic adenomata (adenomata of the cirrhotic liver). At any rate, the presence of evident signs of inflammation in certain angiomata of the nervous system, and especially in angiomata of anencephaly seems to support this hypothesis.

PERIPHERAL NERVES

Spurling, R. G. and Jelms, F.: Spasmodic Torticollis: Notes upon Its Etiology and Treatment. *Scand. J. J.*, 1933 XLVI, 237.

The authors briefly discuss the theories regarding the causes of spasmodic torticollis. The condition is characterized by uncontrollable spasmodic contractions of the neck muscles resulting in nearly constant jerking of the head. The authors believe that a certain number of cases may have an organic basis of an inflammatory nature. In one case there was evidence of old inflammation in the pia-arachnoid of the upper cord. Another case was that of a girl who had had encephalitis lethargica.

The method of treatment used by the authors consists in sectioning the anterior and posterior roots of the first three cervical nerves and the spinal portion of the eleventh cranial nerve. Through a mid-

line incision the laminae of the first three cervical vertebrae are removed. The dura mater is opened in the midline and the anterior and posterior roots of the first three nerves are identified and cut. The filaments comprising the spinal portion of the eleventh cranial nerve course upward between the anterior and posterior roots. At the point where they unite a small artery is usually seen. Troublesome bleeding may ensue at this point if this vessel is not caught with clips before the nerve is cut.

No restraining dressing is applied, but the head is kept immobilized for two days with sandbags. At the end of ten days the patient is encouraged to support his head while in bed, and after two weeks he is placed in a wheelchair and active movement is encouraged.

In the two cases treated by this method the clonic twitching movements were completely relieved.

JOHN W. ELLER, M.D.

MISCELLANEOUS

Serbó, A. von: The Microstructural Traumatic Changes in the Nervous System in the Light of Experiences in the World War (Die mikrostrukturellen traumatischen Veränderungen des Nervensystems im Lichte der Kriegserfahrungen) *Schweiz. Arch. f. Neurol. u. Psychiat.* 1933 XLVI, 27.

The author opposes, as he has done before, the common belief that all symptoms of the nervous system following trauma are a traumatic neurosis or a hysterical reaction. He first discusses in detail the concepts of traumatic neurosis and hysterical reaction and calls attention to their vagueness. He says that not all conditions without evidences of organic disease can be considered hysterical reactions, as is done by Lewandowsky. Neither can every abnormal functional condition be considered hysterical simply because the patient who is suffering from such a condition presents this or that stigma of hysteria.

Hoche claims that the World War showed that nearly everyone is subject to hysteria. He emphasizes that undoubtedly there are a great many post-traumatic neuroses with very fine anatomical microstructural changes in the central nervous system which may be manifested also in a functional manner without additional organic changes. From the large number of cases of injuries which he observed in the World War he came to the conclusion that the late effects of bomb injuries are entirely of an organic nature. It would therefore be incorrect to speak of a shock effect if organic signs were not present at least at first. Accordingly the initial occurrence of unconsciousness, bradycardia, vomiting, and retrograde amnesia after the return of consciousness is necessary to warrant the diagnosis of shock. The results of the cerebral insufficiency produced thereby are headache, vertigo, restless sleep, quick physical and mental fatigue, forgetfulness, inability to concentrate, nervous irritability.

increased reflex irritability, and intolerance of alcohol. Another result may be hemiplegia or neuroplegia, a third, deafmutism a fourth, meningismus a fifth, cerebellar symptoms and a sixth, symptoms of uncomplicated concussion of the spinal cord. The author has frequently seen general icterus develop from meningismus. In this connection he calls attention to the economic aspects of diseases of the striate body. All of those marked disturbances of motility, anomalies of posture, and grimaces, the pathogenesis of which has been recognized only since recognition of the striate symptoms, were formerly interpreted as hysterical symptoms. The tic also belongs to this group.

In support of his views the author cites the findings of the pathologists: the hæmorrhages of a most delicate nature changes in the cells, chromatolysis and changes in the vasomotor system. The character of the disturbances varies with the site of the hæmorrhages. The author believes that the microscopic findings of Most in the medulla oblongata in

certain cases of late bomb injuries may be present without deafmutism.

The clinical findings which the author cites in support of his views are the presence of blood in the cerebrospinal fluid shortly after the injury and the changes and displacements of the lateral ventricles which may be found even after years by encephalography. Even injuries of the peripheral nervous system may produce externally clinical symptoms similar to those observed late in cases of bomb injuries. He cites freezing, drenchings, and infectious disease such as typhoid fever.

He then takes up the symptomatic picture of pseudospastic paresis with tremor (Fuerstner Nonne) which he observed in hundreds of cases after the battle of the Carpathian Mountains, and then expresses his views on tremor the pathogenesis of which is still unknown. Finally he reviews physiological experiments on the isobolic and heterobolic systems in the nervous system and attempts to offer a solution with them.

FRANZ (Z)

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Menville, J. G., and Bloodgood, J. C.: *Subcutaneous Angiomas of the Breast*. *The Surg* 1933, xvii, 491

Of 5,000 cases of breast conditions, an angioma was found in 9. Eight of the angiomas were benign and 1 was malignant. Of the 8 which were benign, 7 were hemangiomas and 1 was a lymphangioma. Of the 7 hemangiomas only 1 was of the capillary variety. The 6 others were of the cavernous type. The malignant angioma proved to be a hemangio-endothelioma.

Capillary hemangiomas arise from isolated segments of a vessel wall and extend by proliferation of new vessels. Cavernous hemangiomas may be attributed to weakening of the muscular and elastic coats lining the vessels.

Angiomas of the breast are usually found in middle-aged persons as slowly growing, semi-fluctuant subcutaneous tumors. The symptoms are generally of long duration. Angiomas may occur in the male breast as well as the female breast.

As a rule the small localized angioma may be safely excised. In cases of larger and more diffuse lesions, which are usually cavernous hemangiomas, excision is contra-indicated because of the vascularity of the tumor and because perfect hemostasis is sometimes impossible. As a rule irradiation should be the first treatment. *SAMUEL KAMR M D*

TRACHEA, LUNGS AND PLEURA

De Winter, L., and Sebrechts, J.: *Elective Collapse and Apicolysis with Pliobage by Means of Pediculated Muscle Flaps in the Treatment of Pulmonary Tuberculosis* (*Le collapsus électif et apicolysie avec pliobage par muscles musés de leur pédicule vasculaire dans le traitement de la tuberculose pulmonaire*). *Arch. méd.-chir. et f. pper. respir* 1933 vii, 377

Taffier was the first to conceive the idea of treating certain cases of pulmonary tuberculosis by extrapleural detachment of the apex. The authors describe their method of apicolysis and filling of the cavity with the pectoral muscles still provided with their vessels. The steps of the operation are shown in illustrations. The results in 181 cases operated upon in the period from 1926 to Oct. 1, 1931 are given in tables. The article includes also photographs and roentgenograms of some of the patients.

Surgical collapse is indicated in cases in which pneumothorax is prevented by pleural adhesions. It should be used in cases of progressive tuberculosis in which the progress of the condition will not stop until irreparable damage has been done. It should be limited to the diseased parts and their

immediate neighborhood, and should be carried out in stages. No attempt should be made to fill a large cavity by apicolysis. It is best to begin with a small apicolysis and muscle filling and supplement this later by thoracoplasty in 1 or more stages. *ROBERT GOME MORGAN M D*

Bernou, A., and Frochard, H.: *Various Operations for Collapse of the Apex of the Lung. Partial Thoracoplasties With Apicolysis and Apicolysis With Pliobage* (*Les diverses opérations du fauchement du sommet du poulmon. Thoracoplasties partielles avec apicolysie et apicolysies avec pliobage*). *Arch. méd.-chir. et f. pper. respir* 1933, vii, 379.

A few years ago it was generally believed that collapse of the upper part of the lung by partial thoracoplasty favored involvement of the lower part of the lung by the intrabronchial aspiration of mucus from the collapsed apex, and that therefore thoracoplasty should always be total. Recently the advocates of partial thoracoplasty have increased. Some surgeons limit the operation to the first two ribs, which they approach by the supra-clavicular route. Others perform a pleuroparietal detachment (apicolysis) of the lung and fill the cavity thus formed with various substances to prevent re-expansion. Still others have attempted a limited collapse of the lung by resection of the first ribs, a procedure called "paravertebral partial thoracoplasty of the apex." Saenger emphasized the danger of dissemination of the infection by partial intervention, but Bernou and Frochard believe that when partial thoracoplasty is limited to properly selected cases, i.e. cases of microfibrous tuberculosis of the apex with slight secretion, and is performed with a good technique, the danger is much less than has been claimed, and that in any case the other side is quite as much endangered as the base of the lung treated.

On account of the obliquity of the ribs and the consequent anatomical structure of the thoracic cage the authors are convinced that even a very extensive resection of the two first ribs is less effective than the resection of two or three adjacent ribs. They state that as a rule the lowest rib to be resected should be that projected on the screen below the lesion. If the lesion is deep or near the anterior wall, the resection should extend farther down. In males, the resection should be extended two ribs below the projected lesion. Of the last rib, only the posterior angle need be resected. In females, a similar resection produces more marked collapse. This procedure has given very satisfactory results. The surgeon may at least begin with it and extend the operation later if necessary.

Bernou and Fruchaud do not recommend phrenicectomy as a preliminary to thoracoplasty except in cases in which it may be expected to reduce expectoration, the activity of the lesions, and the number of ribs to be resected. In cases of dense ulcerofibrous lesions limited to the upper lobe and already well retracted it is useless. Moreover it has the disadvantage of considerably reducing the function of the normal parenchyma of the base of the lung. It is contra-indicated also in cases in which the opposite side is not entirely normal.

In apicolysis with plombage the shock is considerably less than in partial thoracoplasty. Therefore the former procedure is indicated for patients who are unable to undergo thoracoplasty. The post-operative pain is also much less after apicolysis than after thoracoplasty a fact of importance because of the effect of postoperative pain on efforts at expectoration and coughing. In well selected cases apicolysis with plombage often yields very quick results. Among the complications to be feared during or after the operation are elimination of the paraffin through the operative wound, extrapleural hemorrhages and serohæmorrhagic effusions, tearing of the pleura, perforation of the lung cardiovascular complications, postoperative dissemination and infection. The results depend entirely on the therapeutic indication and surgical technique. As a rule the immediate postoperative course is very good. The temperature usually ranges from 38 to 39 degrees C. for a few days and then rapidly falls. However, it sometimes remains slightly elevated for several weeks. Occasionally the patient complains of pain in the shoulder but this subsides rapidly. The clinical signs improve more or less promptly but sometimes not until after a period of increased expectoration such as may occur after any type of collapse therapy.

Thoracoplasty and extrapleural plombage are indicated only when pneumothorax is impossible or has been rendered insufficient by adhesions or some other factor or when phrenicectomy would have only a poor chance of affecting the lesion in the apex of the lung or has been proved unsatisfactory.

Phrenicectomy should be reserved for cases of markedly active and exudative lesions, and in these it should be done with the hope that a thoracoplasty or an apicolysis may be performed later under more favorable conditions. The thoracoplasty or apicolysis should be delayed until the phrenicectomy has had time to exert its fullest effect.

Partial thoracoplasty has its most definite indication in cases of old dense, more or less markedly retracted fibroscaceous lesions of the apex with little exudate. Large encysted cavities with apparently non retractile walls should be treated by thoracoplasty as plombage has a tendency to force them downward without favoring retraction. Thoracoplasty is indicated also for recent, small cavities adherent to the walls. The chance of success is greater the more external the cavity. For cavities projecting inward from a line passing through the

middle of the clavicle a combination of partial operations, either simultaneous or successive, may be necessary. The authors have not hesitated to use plombage for small cavities in the upper internal region of the lung. Partial thoracoplasty may be done also as a supplement to pneumothorax which has left the apex adherent. Some surgeons believed that plombage would be a good adjunct to pneumothorax, but were obliged to abandon its use because the plug showed a tendency to slip.

Plombage is indicated for (1) small, non-encysted apical cavities (2) bilateral circumscribed foci, (3) certain cases of extensive tuberculosis in debilitated subjects in whom extensive thoracoplasty seems contra-indicated and (4) cases in which thoracoplasty has proved insufficient.

The dyspnoea cardiac agitation, and shock so frequently mentioned as complications of these interventions a few years ago are today exceptional. The decrease in their incidence is due to a number of factors: the use of local anaesthesia the selection of incisions giving wide operative exposure without gross mutilation of the muscles gentleness of manipulation careful hemostasis, and limitation of the operations to cases in which they are definitely indicated.

EDITH S. MOORE.

Frommel E.: Primary Carcinoma and Tuberculosis of the Lung (*Cancer primitif et tuberculose du poumon*) *Rev. méd. de la Suisse Rom.* 1933, lili, 7.

Frommel reviews the literature on the relation of carcinoma and tuberculosis of the lung and reports the histories and autopsy findings in nine cases picked from fifty cases of pulmonary neoplasms. He attempts to answer the following questions:

1. Is there any anatomical relation between cancer and tuberculosis?
2. Does the tuberculous process become cancerous or vice versa?
3. Does death result from the cancer or the tuberculosis?

The cases reported are divided into two groups: (1) six cases of carcinoma occurring in the same lobe with an old tuberculosis that had shown no recent sign of activity and (2) three cases of cancer associated with active tuberculosis in the same lobe.

Frommel concludes from his observations that the cancerous process is ingrafted upon the tuberculosis that the tuberculosis is a precancerous affection that the two conditions bear a very close relationship to each other and that in the majority of cases the carcinoma develops in an old or only very slightly active tuberculous process.

MARSH W. POOLE, M.D.

ESOPHAGUS AND MEDIASTINUM

Parceller A. and Chenut, A.: Deep Diverticula of the Esophagus (*Les diverticules profonds de l'oesophage*) *Bordeaux chir.* 1933 No 1 25.

Most esophageal diverticula occur in the upper third or cervical portion of the esophagus. Regard

less of their location, they cause no symptoms until they attain a certain size. Most of them are not diagnosed because they must attain at least the size of a walnut to be discovered by X ray examination.

Diverticula of the esophagus are of three types—traction diverticula, pulsion diverticula, and diverticula associated with mega-esophagus. Traction diverticula, the most common type, are small and usually found at the level of the bifurcation of the trachea. They are symptomless except when, as rarely they rupture and give rise to an alarming clinical picture such as that of pulmonary abscess or esophagotracheal fistula. Pulsion diverticula are rare. Prazmowski found only 7 in autopsies performed during a period of five years. They were located in the middle or lower third of the esophagus. They are often designated as epiphrenic diverticula and are most amenable of the deep diverticula to surgery. Twelve cases of diverticula associated with mega-esophagus were reported by Smith.

Some surgeons believe that pulsion diverticula rarely give rise to symptoms unless they are associated with cardiospasm, but the authors believe that if they attain the size of a walnut they cause difficulty in deglutition, particularly of solids, regurgitation of food eaten at previous meals, and such secondary symptoms as loss of weight. When the symptoms are not amenable to medical treatment resection of the diverticulum should be planned.

Most pulsion diverticula in the lower third of the esophagus—eight out of twelve according to Denescker—occur on the right side anteriorly. Several operations for their relief have been suggested. Zaejer recommends fixing the sac to the chest wall, opening it after the formation of adhesions, and then allowing it to fill in by granulation. This operation is applicable only to very large diverticula. Another operation consists in anastomosis of the diverticulum to the stomach. This is applicable only to diverticula on the left side and frequently is followed by loosening of the suture line.

The operation recommended by the authors is complete resection. So far as the authors are aware, it has been done successfully in only five cases. In 3 of them it was done by Sauerbruch. The chief difficulty in operation for esophageal diverticula has been the high incidence of pulmonary infection due to the fact that the esophagus has been approached by the transpleural route. The authors describe an operation for the resection of diverticula in the lower third of the esophagus on the right side by a subpleural approach. A vertical incision is made on the posterior chest wall, about two fingerbreadths from the midline of the back, from the level of the ninth rib down to the eleventh rib and then horizontally along the eleventh rib to the posterior axillary line. The tenth, eleventh, and twelfth ribs are resected to the posterior axillary line for a distance of about 10 cm. The ninth rib is cut at the same level to allow more room, but is not resected. The pleura is reflected from the ribs and diaphragm by blunt dissection. This subpleural approach allows easy

delivery of the esophagus for a distance of 5 or 6 cm. The diverticulum is then resected and the esophagus closed with three layers of sutures. In their own case, that of a man forty nine years old, the authors placed a large drain in the region of the anastomosis in addition to a gauze pack. The drain was removed by gradual traction by the second day, and the pack was removed on the seventh day. The patient died on the thirtieth day after the operation from sudden rupture of the aorta due apparently to injury to the vessel by the drain. The authors therefore advise the use of small, fine drains.

In conclusion Parceller and Chentur report the operative results in seven cases of intrathoracic diverticula of the esophagus—four treated by Sauerbruch, one by Los-Quintero, one by Enderlein, and one by Stierlin, and their own case. Death occurred in the three last mentioned cases and in one of those treated by Sauerbruch.

JOSEPH T. GAULE, M.D.

MISCELLANEOUS

PAGGI, R., and LUCCARELLI, G.: Experimental Research on Surgical Immobilization of the Thorax (*Ricerche sperimentali sulla immobilizzazione chirurgica del torace*) *Arch. Ital. di chir.* 1933 *xxviii*, 37

Within a few years the well-known methods for immobilization of the thorax have been increased by scalenectomy of all three groups of scalenus muscles and neurectomy or alcohol injection of the intercostal nerves. The authors report an experimental study of the effects of these procedures used alone and in conjunction with others.

The action of the scalenus muscles seems to depend on their function in the fixation of the first two ribs so that the intercostal muscles may act from these fixed points. Various techniques for scalenectomy have been described. In clinical cases scalenectomy results in a reduction of approximately 9 per cent in pulmonary ventilation. In dogs, the authors found that it caused a definite reduction in the thoracic excursion on the side operated on.

In clinical cases neurectomy of the intercostal nerves results in a variable decrease of thoracic movement. In animals, the authors found that it caused a definite diminution in the depth of the respirations on the affected side but no change in the rate.

Alcohol injection of the intercostal nerves in animals resulted in some irregularity of respiration on both sides, but practically no change in the thoracic excursion. After a month or two the rate became regular and normal again.

The combination of scalenectomy neurectomy of the intercostal nerves, and phrenico-cereals resulted in the most marked permanent reduction of the thoracic excursion, but the reduction was not equal to the sum of the reductions noted when these procedures were done individually.

A. LOUIS ROSE, M.D.

Reichert F. L. Experimental Studies on the Effect of Paralysis of the Diaphragm and of Its Removal. *J Thoracic Surg* 1933, II, 349.

Reichert reports experiments carried out on dogs to determine the late changes following unilateral phrenicotomy and to note whether paralysis of one side of the diaphragm would produce any effect upon the growing puppy. Attempts were made also to produce diaphragmatic hernia. Subsequently the effects of total paralysis of the diaphragm and of subtotal and total removal of this muscle were studied to determine what procedure might be useful in clinical cases in which it is necessary to remove a large portion of the diaphragm.

In young and half grown puppies which were kept under observation as long as two years after the operation, unilateral phrenicotomy caused no change in the movement or shape of the thorax or the development of the thoracic cage.

Following double phrenicotomy with diaphragmatic paralysis paradoxical respiration developed at once. The diaphragm was found elevated and the abdominal wall and lower thorax were retracted, but the midthoracic region was enlarged on inspiration to a degree which compensated by half the decrease in the pulmonary area caused by the elevation of the diaphragm. On inspiration there was slight decrease in the pulmonary area, but the maximum effect of this was offset by the midthoracic enlargement. On expiration, the pulmonary area was decreased only by the elevation of the diaphragm. On inspiration as compared with expiration, the heart shadow was slightly larger and shifted to the right.

Efforts to produce diaphragmatic hernia in puppies, with and without previous hemiparalysis of the diaphragm, were made in the following way

A stout linen thread was passed through the dome of the left diaphragm in such a manner that by a sawing motion the thread could be made to cut through the diaphragm, leaving a crescent or nearly circular opening. With the animal still under ether anesthesia, sudden pressure was made upon the abdomen and in some instances the peritoneal cavity was distended with injected air. In other cases this procedure was carried out a month after the left diaphragm had been paralyzed by phrenicotomy. Herniation could not be produced consistently in any case.

In one dog deliberate excision of both domes of the paralyzed diaphragm was done six weeks after bilateral phrenicotomy. The crura, the esophageal opening, and the opening of the vena cava being left undisturbed. After this procedure X ray examination showed changes in the shape of the thorax which produced a slight decrease in the pulmonary area, but in no case was a hernial sac formed nor was there any further ascent of the abdominal contents.

Finally total and subtotal removal of the diaphragm were done to determine how much of the diaphragm could be removed successfully whether previous paralysis of the muscle facilitated removal

and what factors jeopardized the successful operative procedure. It was hoped that something might be learned of the feasibility of excision of large portions of the diaphragm for malignant growths. Total removal was invariably fatal not, however because of the direct effects upon the lungs, but because of interference with the circulation resulting from the mobilization of the heart produced by separation of the mediastinum from the diaphragm and by congestion of the abdominal organs caused by kinking of the vena cava. When the heart was immobilized by anchoring the mediastinum to the chest wall, the opening for the vena cava being left undisturbed, the animals showed no more disturbance than after paralysis or partial removal of the diaphragm.

The author summarizes his findings as follows

1 Unilateral phrenicotomy caused no changes in the movement, shape, or development of the thoracic cage.

2 Paralysis of the diaphragm was immediate and hemi-atrophy was evident within two weeks after the phrenicotomy.

3 Tears in a normal or paralyzed hemi-diaphragm followed by sudden abdominal pressure failed to produce herniation.

4 Bilateral phrenicotomy was followed immediately by paradoxical respiration and a scaphoid abdomen, but the activity of the animal was unimpaired. Enlargement of the midthoracic region upon inspiration compensated by half for the decrease in the pulmonary area caused by the elevation of the diaphragm. The cardiac shadow on expiration was slightly larger and shifted to the right.

5 Total removal of the diaphragm was uniformly fatal because of interference with the circulation caused by mobilization of the heart and kinking of the vena cava.

6 When the heart was stabilized by suturing the mediastinum to the chest wall, the opening for the vena cava being left undisturbed subtotal diaphragmectomy was not fatal.

G PAUL LAROCHE, M.D

Contat, C.: A Contribution to the Study of Diaphragmatic Hernia. A Case of True Congenital Diaphragmatic Hernia (Contribution à l'étude des hernies diaphragmatiques. Un cas de hernie diaphragmatique congénitale vraie) *Ann d'nat path.*, 1933 2, 1

The author reports a case of true congenital parasternal diaphragmatic hernia in an infant eleven months old. Parasternal localization of congenital diaphragmatic hernia is extremely rare. Only three other cases of such localization have been recorded in the literature namely those reported by Kratzsch, Thoma and Eppinger. Hernia of this type are formed after the third month of intra-uterine life. They are probably caused by the slow and progressive crowding together of hernial masses into areas of decreased resistance by the pressure of the intestinal mass augmented by the pressure exerted by excessive development of

the right lobe of the liver. The rare retrosternal and bilateral localization may be due to formation of the hernia through the primary sternocostal interstices of the diaphragm. The small size of the hernial masses may explain the fact that the lesion is relatively well tolerated in spite of the excessive development of the liver and the consequent displacement of several of the important abdominal viscera.

In the case reported by the author death occurred from chronic bronchopneumonia with pulmonary emphysema leading to secondary acute dilatation of the heart, acute congestion of the principal viscera, and extreme cachexia, but it is probable that the hernia had some influence on the course of the pulmonary affection as crowding of the heart against the lung formed a groove in the lower lobe of the left lung. Absence of muscle fibers in the membranous band separating the two hernial sacs at the median line and in the wall of the sac was an important feature.

In discussing diaphragmatic hernia in general the author mentions acquired hernia only briefly to emphasize the occasional appearance of a non-traumatic type in the aged. These are true para-ster-
nal hernia. Between the costal and sternal fibers and between the costal fibers themselves there will be found in most cases a space deprived of muscle fibers where the pleura and peritoneum are in direct communication except for the interposition of fatty tissue. Some surgeons attribute these hernia to the existence of a normal hiatus between the costal and sternal fibers. Others believe they are due to a visceral cause. In the aged, circulatory disturbances are common and the diaphragm may have lost its normal histological structure, giving place to a fibrous tissue. Microscopic examinations seem to support the latter theory.

Most reports on congenital diaphragmatic hernia are concerned with false rather than true hernia. True hernia are much less common than false hernia.

The false congenital diaphragmatic hernia has no hernial sac and is due to arrest of development before closure of the coelomic cavity of the embryo, i.e., between the third week and third month of intra-uterine life. False congenital diaphragmatic hernia constitute 86.75 per cent of congenital diaphragmatic hernia. They occur five times as often on the left side as on the right side. By some, this is attributed to the fact that the liver is more developed on the right side. It is probable that most false congenital diaphragmatic hernia are formed at the end of the second or the beginning of the third month of pregnancy.

The true congenital diaphragmatic hernia has a sac. It occurs about four times as often on the left side as on the right side. The size of the membranous sac varies according to the extent of the lesion. Hernia of this type are found most commonly in the region of the lumbocostal triangle, to the right of the speculum belmontii or in the center of the diaphragmatic arc. Para-ster-
nal localization is very rare. Most surgeons believe that areas of diminished resistance play an important part in their development. It seems to the author necessary to add a special influence of the abdominal mass pressing upward. The lesser development of the left lobe of the liver is attributed also to pressure of the viscera. Such pressure is exerted slowly progressively and constantly and after the third month of intra-uterine life prevents the development of muscle fibers, thus forming a new area of diminished resistance. The fact that the left half of the diaphragm closes later than the right may also explain the greater incidence of diaphragmatic hernia on the left than the right side.

EDNA S. MOORE.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Rademacher L.: The Effect of Blood in Experimental Peritonitis. *Ann. Surg.* 1933 xcvi, 414.

From experiments on guinea pigs the author concludes that blood injected intraperitoneally with organisms not only causes no predisposition to peritonitis, but offers some protection against it at least so far as the colon bacillus is concerned.

Of control animals receiving a minimal lethal dose of organisms, all died whereas of sixteen receiving a minimal lethal dose of organisms with varying amounts of blood only 1/2 died from peritonitis and these two received only a small amount of blood. Doses below the minimal lethal amount were not raised to the minimal lethal amount by the use of blood. That this effect was not the result of mechanical dilution was later proved by the addition of broth in varying quantities to the minimal lethal doses of bacteria without effect.

Peritoneal smears also indicated that blood hastens the disappearance of bacteria from the peritoneum.

As Allen has shown that the addition of a small amount of blood increases the incidence of empyema of the pleural cavity when certain organisms are injected, the results of the author's experiments suggest that the pleura and peritoneum do not respond in a similar manner to the presence of blood introduced with organisms.

SAMUEL KAHN M.D.

GASTRO-INTESTINAL TRACT

Mondor H., and Porcher P.: Urgent X Ray Examinations in Peritonitis Following Perforation of the Digestive Tract (Examinations radiologiques d'urgence des péritonites par perforation du tube digestif). *J. de chir.*, 1933, xli, 30.

In cases in which a silent perforation of the digestive tract with the production of pneumoperitoneum is suspected, early X-ray examination is imperative and often will save life. A fluoroscopic examination should be made first with the patient in dorsal decubitus to study the motility of the diaphragm and the topography of the gas spots in the abdomen, and then with the patient in the vertical position to examine the subphrenic space for the collection of gas. Roentgenograms should be made with the patient in the vertical and left lateral decubitus positions. The authors warn against the administration of a barium meal and of gaseous substances. Immobilization of the diaphragm by a subphrenic collection of gas secondary to perforation was not observed in their series of seventeen cases. Occasionally there was limitation of respiratory movement which appeared to be associated with contraction of the abdominal

muscles. In one case a subhepatic bubble of gas was observed when there was no gas under the right leaf of the diaphragm.

In some cases pneumoperitoneum is not recognized because the examination is made too quickly or with inadequate apparatus or pneumoperitoneum is diagnosed when it is not present or it is interpreted incorrectly. In one of the cases cited by the authors the colon interposed itself between the liver and the right leaf of the diaphragm, pushing the liver down and producing an X ray picture suggesting pneumoperitoneum.

Assmann states that whereas the gas in the colon is only slightly mobile, intraperitoneal gas varies with the position of the patient and rises to the area of highest elevation.

Cases of postoperative pneumoperitoneum were also studied with the X ray. In one of them the gas remained for nineteen days.

The authors report several cases in which perforating ulcers not recognized clinically were diagnosed by the X ray demonstration of pneumoperitoneum. review cases of typhoid, peptic, tuberculous, dysenteric, and traumatic perforations from the literature and report two cases of perforated peptic ulcer and perforated ulcer of Meckel's diverticulum occurring in children.

In conclusion they state that the absence of pneumoperitoneum in cases of suspected perforating ulcer does not contra indicate laparotomy and that an X-ray diagnosis of pneumoperitoneum confirms the clinical demonstration of tympany over the liver.

The article contains numerous roentgenograms.

FRANKLIN JOHN DE PRUME, M.D.

McIver M. A.: Acute Intestinal Obstruction. Fourth Installment. *Am J Surg.* 1933 xi, 169.

Neoplasms are responsible for about 17 per cent of all cases of obstruction of the intestines exclusive of those caused by external strangulated hernia, and are the most common cause of intestinal obstruction, exclusive of hernia, in persons past middle life. Of 33 cases of obstruction due to neoplasms in the Massachusetts General Hospital, 19 were due to primary carcinoma of the bowel and 6 to metastatic carcinoma. Of the primary neoplasms, those arising in the large intestine were the most frequent cause of obstruction, and of the latter those located in the sigmoid accounted for about half of the obstructions. Carcinoma of the sigmoid was the cause of the obstruction in 12 cases. In the 13 other cases of carcinoma, the sites of the lesion were equally distributed among the other anatomical divisions of the large intestine.

Acute obstruction from a neoplasm is usually the result of a stenosing fibrocarcinoma and is probably

the right lobe of the liver. The rare retrosternal and bilateral localization may be due to formation of the hernia through the primary sternocostal interstices of the diaphragm. The small size of the hernial masses may explain the fact that the lesion is relatively well tolerated in spite of the excessive development of the liver and the consequent displacement of several of the important abdominal viscera.

In the case reported by the author death occurred from chronic bronchopneumonia with pulmonary emphysema leading to secondary acute dilatation of the heart, acute congestion of the principal viscera, and extreme cachexia, but it is probable that the hernia had some influence on the course of the pulmonary affection as crowding of the heart against the lung formed a groove in the lower lobe of the left lung. Absence of muscle fibers in the membranous band separating the two hernial sacs at the median line and in the wall of the sac was an important feature.

In discussing diaphragmatic hernia in general the author mentions acquired hernia only briefly to emphasize the occasional appearance of a non-traumatic type in the aged. These are true parasternal hernia. Between the costal and sternal fibers and between the costal fibers themselves there will be found in most cases a space deprived of muscle fibers where the pleura and peritoneum are in direct communication except for the interposition of fatty tissue. Some surgeons attribute these hernia to the existence of a normal hiatus between the costal and sternal fibers. Others believe they are due to a visceral cause. In the aged, circulatory disturbances are common and the diaphragm may have lost its normal histological structure giving place to a fibrous tissue. Microscopic examinations seem to support the latter theory.

Most reports on congenital diaphragmatic hernia are concerned with false rather than true hernia. True hernia are much less common than false hernia.

The false congenital diaphragmatic hernia has no hernial sac and is due to arrest of development before closure of the coelomic cavity of the embryo, i.e., between the third week and third month of intra-uterine life. False congenital diaphragmatic hernia constitute 80-75 per cent of congenital diaphragmatic hernia. They occur five times as often on the left side as on the right side. By some, this is attributed to the fact that the liver is more developed on the right side. It is probable that most false congenital diaphragmatic hernia are formed at the end of the second or the beginning of the third month of pregnancy.

The true congenital diaphragmatic hernia has a sac. It occurs about four times as often on the left side as on the right side. The size of the membranous sac varies according to the extent of the lesion. Hernia of this type are found most commonly in the region of the lumbosacral triangle, to the right of the speculum helmontii or in the center of the diaphragmatic arc. Parasternal localization is very rare. Most surgeons believe that areas of diminished resistance play an important part in their development. It seems to the author necessary to add a special influence of the abdominal mass pressing upward. The lesser development of the left lobe of the liver is attributed also to pressure of the viscera. Such pressure is exerted slowly progressively and constantly and after the third month of intra-uterine life prevents the development of muscle fibers, thus forming a new area of diminished resistance. The fact that the left half of the diaphragm closes later than the right may also explain the greater incidence of diaphragmatic hernia on the left than the right side.

EDWIN S. MOORE.

surviving for fifty two and seventy days the outstanding feature was marked emaciation.

The authors conclude that an important cause of death in high intestinal obstruction is the loss of digestive secretions. Sodium chloride solution administered through a jejunostomy opening below the obstruction replaces the water and important blood electrolytes, fixed base (chiefly sodium) and chloride ions which are ordinarily lost as the result of failure of absorption and continued vomiting. In low obstruction and obstruction complicated by necrosis of the bowel, the loss of digestive secretions may be a factor in the causation of death, but is of varying importance. In these conditions toxemia probably plays the more important rôle and operative relief of the obstruction should be done immediately. The beneficial effect of the subcutaneous or intravenous administration of saline solution appears to depend largely on the extent to which the body has suffered from the loss of digestive secretions due to failure of re absorption and vomiting.

JOHN W. NIXON, M.D.

Otschkin, A. D. The Clinical Aspects of Thrombosis of the Mesenteric Veins and the Portal Vein in Appendicitis (Zur Klinik der Thrombose der Mesenterialvenen und der Pfortader bei Appendicitis) *Arch. f. Klin. Chir.*, 1932, cxlxi, 758.

Thrombosis of the mesenteric veins usually develops in such a manner that a thrombus of the veins of the mesenteric lumen of the inflamed appendix is formed. The thrombus extends into the ileocolic vein, the superior mesenteric vein, and finally into the portal vein with its branches in the liver. Sometimes, from the thrombus in the mesenteric or the ileocolic vein a piece breaks off as an embolus and, avoiding the valves of the vein, reaches the liver directly and causes the formation of a solitary abscess. The size of the thrombosed area and the clinical course do not depend to any degree upon the amount of change in the appendix. Occasionally extensive thromboses with suppurative degeneration accompany changes in the appendix which can be demonstrated only microscopically. On the other hand the most extensive destructive processes of the appendix may not produce pylephlebitis.

The following figures show the frequency of pylephlebitis. Rostowzeff saw 2 cases in 163 cases of appendicitis, Bernhard saw 5 in 398. Matterstock saw 11 in 148, Moschkowitz saw 7 in 1549, Bruehe saw 15 in 2500, and Eliason saw 3 in 2,337. Of 46 cases of pylephlebitis, collected by Lugdon Brown, 43 per cent were caused by appendicitis. Eliason and Stillman found that pylephlebitis occurred in 7 per cent of cases of appendicitis. According to Burlew Bendie Short found pylephlebitis in only 0.4 per cent of 2714 cases of appendicitis, Gerster found it 9 times in 1189 cases, and Krogus found it twice in 1,000 cases. Of the author's 1,692 cases of acute appendicitis pylephlebitis occurred in 15 (0.88 per cent). In 9 it was not recognized during life.

A review of the total autopsy material in the period from 1911 to 1931 (15,747 autopsies) revealed 25 cases of pylephlebitis in which appendicitis with thrombosis of the mesenteric and liver veins was present. Twelve of these cases came from the surgical clinic and the remaining 13 from the other departments of the hospital. In the latter the diagnosis before autopsy was abdominal typhus, typhoid fever, suppurative angiocholitis, adnexal disease, sepsis, or tuberculous peritonitis. In all of these cases the disease had its origin in the appendix.

The clinical picture of this complication, which frequently presents great difficulties in diagnosis is described by the author on the basis of 10 case histories. In 3 of the cases the peritoneal symptom which is so characteristic of acute appendicitis was obscured by a severe infection which had no connection with the point of origin. Accordingly for this reason also an incorrect diagnosis was made. At first, there were pains in the abdomen but none was localized at McBurney's point. For the most part, the pains were in the upper part of the abdomen on the right side in relationship to the incipient involvement of the liver. The difficulties in the diagnosis are greater the later the patient comes for treatment. The variations from the syndrome of acute appendicitis consist of the short duration of the symptoms, their slight intensity and their disproportion to the severe general clinical picture. An outstanding symptom is distention of the abdomen in the nearly complete absence of dyspeptic symptoms and intestinal paralysis. Characteristic are chills which frequently indicate the beginning of the disease. The leucocyte count ranges from 10,000 to 28,000. The blood picture is characterized by a constant diminution of the erythrocyte count and hemoglobin content. The increase in the leucocyte count apparently coincides with the suppurative degeneration of the thrombus and the formation of suppurative foci in the retroperitoneal cellular tissue or the liver. Icterus of the sclera appears with the spread of the inflammatory process to the liver tissue. A rapidly increasing icterus in the presence of continuous chills is unfavorable and may lead to a false diagnosis. The clinical picture is characterized by asthenia and fatigue. Consciousness remains clear up to the last day. True ascites is not observed. In 3 of the author's cases elevation of the dome of the right side of the diaphragm was seen on roentgen examination.

In 7 of the 10 cases reported death resulted. On the basis of 53 cases collected from the literature and 14 cases of his own in which there were 7 deaths, Eliason reported the mortality as 54.5 per cent. In 15 cases seen by the author there were 12 deaths a mortality of 80 per cent.

As a surgical measure against thrombosis, Wilms recommends ligation of the ileocolic vein at the ileocolic angle. Braun attempts to prevent further spread of the thrombus to the portal vein by ligating the ileocolic vein at the point where it empties into the superior mesenteric vein and performs this

ligation as soon as possible in cases of appendicitis in which thrombosis is suspected. Melchior collected from the literature 8 cases which were treated by this method with a successful outcome and reported a case of his own in which a laparotomy with ligation of the ileocolic vein was done because of chills following appendectomy. The result was successful.

The author concludes that early diagnosis and operation are the best preventives of pyelophlebitis. Ligation of the ileocolic vein according to Braun's method is to be regarded only as an auxiliary measure against the severe complications accompanying pyelophlebitis. It is possible for a thrombosis to run a favorable course, but this cannot be foretold in the individual case.

HAUWARTH (Z)

Railford T. S.: Carcinoma of the Transverse Colon. *Surg. Gynec. & Obst.* 1933, 161, 820.

Of 107 carcinomata of the colon treated at the Johns Hopkins Hospital, Baltimore, only 32 (7.3 per cent) were located in the transverse colon between the hepatic and splenic flexures. Twenty-one were in the hepatic flexure, 18 in the splenic flexure, 109 in the descending colon and sigmoid, and 95 in the ascending colon and cecum. The site of the remaining 31 could not be ascertained from the records.

The transverse colon is approximately of the same length as the ascending and the descending colon, but the frequency of cancer in the transverse colon is only one fifth that of cancer in the ascending or descending colon. There is no great difference in the incidence of cancer in the transverse colon as compared with the hepatic and splenic flexures.

The transverse colon is functionally more active and therefore less subject to stasis than other parts of the colon, but stasis and irritation have not been proved responsible factors in cancer formation.

Of the 32 tumors reviewed by the author, all occurred in white persons. Thirteen of the patients were males. The majority of the tumors were of the annular "napkin-ring" type and on histological examination were found to be adenocarcinomata. Sixty per cent showed mucoid degeneration.

The clinical symptoms of the disease are not specific until obstruction occurs. They are frequently similar to those of stomach and gall-bladder disease. Tumors are usually palpable early. The diagnosis must be made by X-ray examination after a barium enema. Extension of the disease to the stomach occurred in 8 of the 32 cases reported. To discover such extension before operation the stomach should be examined with the X-ray after a barium meal. In the surgical treatment removal of a portion of the stomach may be necessary. More commonly the posterior wall is removed.

Of the 32 cases studied, 18 were operated upon. Six (33.3 per cent) of the patients operated upon died as the result of the operation and 3 died of recurrence. In the cases of 4 the ultimate result is not known. Three who were operated upon five years ago and 3 who were operated upon less than five years ago are apparently well.

With regard to the technique of the operative procedure the author calls attention to the fact that extension of the disease along the lumen of the bowel is of less importance than has hitherto been believed. The disease has rarely been found more than 3 in. from the site of the primary growth. The importance of the removal of a wide margin of gut is therefore frequently overrated.

Great care is necessary to dissect each branch of the middle colic artery so that the viability of both stumps will be preserved. In fat mesenteries this may be difficult.

After resection, end-to-end or lateral anastomosis may be done, depending on the case. The author prefers lateral anastomosis when it is possible. Of the 2 satisfactory methods of lateral anastomosis— isoperistaltic and antiperistaltic— he prefers the antiperistaltic method of Bloodgood. This brings the blind ends of gut outside of the peritoneal cavity so that in case of gangrene or rupture of the blind ends nothing more harmful than a fecal fistula will result.

If the tumor is in the proximal portion of the transverse colon, the entire right half of the colon should be removed.

Adenocarcinoma is not radiosensitive.

G. PAUL LA ROOZE, M.D.

Keller W. L.: Annular Stricture of the Rectum and Anus. *Am. J. Surg.* 1933, 22, 25.

This is a preliminary report, based on eight cases, regarding the treatment of annular stricture of the rectum and anus by tunnel skin grafts.

The tunnel grafting is preceded by local irrigations for several days to diminish septic proctitis. It consists essentially in threading tubular skin grafts beneath the structured anal surface, parallel with the anal canal, in the four quadrants. After the grafts have become established they are incised longitudinally with one blade of the scissors in the canal of the graft and the other blade in the anal canal, the anal orifice and rectal canal being thereby enlarged.

In the cases reviewed the operative record covers a period of eleven years. The operation was successful in seven of the eight cases.

CHARLES F. DUBOIS, M.D.

Kalish, H. I., and Saltzstein, H. C.: Sarcoma, Melanoma, and Leukosarcoma of the Rectum. *Arch. Surg.* 1933, 27, 633.

Fifty-tenth per cent of all rectal neoplasms are sarcomata.

The authors report three sarcoma, three melanomata, and one leukosarcoma of the rectum. There was little distinguishable difference between the clinical course of melanoma and sarcoma. Even a histological differentiation between those two types of tumor may be difficult as melanomata tend to develop spindle cells and at first their pigment may be absent or so scanty as to escape detection.

Both sarcoma and melanotic growths arise beneath the mucosa, ordinarily in either the anal canal or the lowest part of the ampulla. In the cases reported by the authors they originated on the anterior rectal wall although it is usually stated that the posterior wall is involved first.

The primary objective manifestation—the mass beneath the mucosa—is at first of insignificant appearance and may be confused with a benign polyp or hemorrhoid.

The mucosa remains intact as the early growth proceeds. Sometimes a polyp develops and is extruded with bowel movements. More often there is a local mass which is indistinguishable from carcinoma except that the mucosa remains intact longer, ulceration occurs later the marked obstruction characteristic of some rectal cancers is absent, and digital examination gives the sensation of compression from an extramucosal mass rather than the sensation of direct involvement of the mucosa with early crater formation.

The prognosis is very unfavorable. Of the patients whose cases are reported by the authors all are dead except one who was well eight months after treatment. One lived four years after the removal of a rectal polyp which showed melanoma on microscopic examination, and then died following cerebral symptoms.

Chisaborn, A. J. The Relation of Pulmonary Tuberculosis to Anorectal Fistulae: A Clinical, Pathological and Bacteriological Study. *Surg., Gynec. & Obst.*, 1933 lvi, 610.

As the result of sanitary hygiene the incidence of fistula-in-ano has steadily decreased. The decrease has been especially marked in the last twenty years. The primary cause of the condition is an abscess in the tissues surrounding the rectum which is brought about by congenital cysts, a foreign body fissures, ulcers, suppuration of the intramuscular glands, or tubercle. Except in cases of tubercle, the infective organism is probably not important. Tuberculous fistulae can usually be diagnosed from the appearance of the parts, but this is not entirely reliable. Histological examination of a few pieces of the wall of the fistula is fairly reliable, but the diagnosis can be made with certainty only by inoculation of guinea pigs.

Ischiorectal abscess and fistula-in-ano occur in males about 8 times as often as in females. In about 5 per cent of cases of pulmonary tuberculosis in males the pulmonary condition is associated at some time with ischiorectal abscess or fistula. Fistula occurs 13 times more often in tuberculous than in non-tuberculous males and frequently before any signs of lung lesions. It is most common between the ages of thirty and forty years.

Of 155 patients with anorectal fistula whose cases are reviewed by the author 106 were free from evidence of pulmonary tuberculosis, 18 had an arrested pulmonary tuberculosis and 31 had an active pulmonary lesion.

Tubercle bacilli were found by bacteriological methods (guinea pig inoculation and cultures) in the cases of 77 per cent of the patients with active pulmonary tuberculosis, 55 per cent of those with inactive pulmonary tuberculosis and none of those who were free from evidence of pulmonary tuberculosis. This suggests a close etiological relationship between tuberculosis of the lungs and tuberculous ischiorectal abscess and anorectal fistula.

WILLIAM E. SHACKLETON, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Melli, G.: Hepatosplenomegaly with Jaundice (Epato-splenomegalie con ittero). *Polidin Rome*, 1933 xl, sez. med. 69.

The author reports the cases of five patients who, for periods ranging from seven to nine years suffered from jaundice associated with enlargement of the liver and spleen. The essential pathological process was studied at operation or autopsy. So far as could be determined clinically the jaundice seemed to be due to incomplete occlusion of the biliary processes. The patients experienced attacks of fever alternating with periods of freedom from symptoms.

In discussing the pathological processes capable of producing the symptoms noted in his cases the author refers particularly to the effect of calculi and chronic infections in the biliary passages. He doubts that hyperactivity of the liver or "hyperhepatism" is the fundamental factor. He doubts even the occurrence of such a condition.

Melli discusses also the relationship of his cases to Hanot's disease. He reviews the theories regarding the causes of Hanot's disease and concludes that the basic factor is an obstruction of the biliary passages, commonly from calculi or angiocholitis and pericholangitis, which initiates and maintains a chronic infection of the bile ducts and liver cells. The enlargement of the spleen he attributes to infection and stasis.

Early surgical intervention for relief of the biliary obstruction offers the only means of radical cure.

PETER A. ROSE, M.D.

Mocquot, P.: Surgical Intervention in Certain Retention Jaundices Without Organic Obstruction. The Influence of External Biliary Drainage on the Hepatic Functions (L'intervention chirurgicale dans certaines icteres par retention sans obstacle. Influence du drainage biliaire externe sur les fonctions hepatiques). *J. de chir.*, 1933 xlii 177.

The author reports two new cases which support his previously expressed theory that an obstructive type of jaundice may occur without actual obstruction and should be treated by biliary drainage.

The first case was that of a woman forty-one years old who gave a history of intermittent attacks of dyspepsia and colicky pain in the upper right quadrant of the abdomen, the last one of which was asso-

dated with jaundice. These symptoms dated back nine years. The stools had often been clay colored and the urine dark.

At operation, no pathological changes could be discovered in the bile passages. The liver was moderately enlarged, but otherwise normal. Simple cholecystostomy was performed. The bile from the fistula was sterile. At times it was dark and thick, and at other times pale and fluid. Chemical analysis failed to show the expected relation between its appearance and its chemical composition. The pale fluid bile contained the most solids.

The complete integrity of the biliary passages was demonstrated by roentgenograms taken after the injection of Ipiodol through the fistula.

After one month of drainage the fistula was allowed to close. Recovery was complete except for a persistent mild anorexia.

The second case was that of a man forty-two years old. Two weeks before the patient entered the hospital he noted that his skin had a yellow tint. Generalized jaundice soon developed and the stools became clay colored. Pain was absent, but there was rapid loss of weight. Physical examination disclosed only enlargement of the liver and spleen.

At operation, a greatly enlarged, dark liver was discovered. The gall bladder and ducts appeared entirely normal. Cholecystostomy was performed. The bile was sterile.

Six weeks of drainage was required before the jaundice cleared up. Roentgenograms taken after the injection of Ipiodol showed a slight delay in the passage of the oil into the duodenum, but there was no evidence of obstruction. Recovery was uneventful. Eighteen months later the patient was well.

Five cases reported by other surgeons are cited briefly. One of the patients eventually died of subacute hepatitis.

The characteristics common to all of these cases were enlargement of the liver and loss of weight. A study of the bile revealed nothing regarding the hepatic disturbance except that it was not of the nature of a cholangitis or an infectious hepatitis. This problem might be solved by biopsies on the liver. One such biopsy was performed by Chabrol, Brocq, and Portu. The essential lesion was found to be a portal fibrosis. ALBERT F. DE GROOT, M.D.

Tytgat: Operative Indications in Hepaticobiliary Surgery (Les indications operatoires en chirurgie hepatobiliaire) *Brasileira med.* 933 XII, 535

There is hardly a disease of the liver that may not require surgical operation at some time in its course. The author discusses briefly the surgery of trauma, tumor and abscess of the liver but devotes the greater part of his article to acute cholecystitis, in which he thinks early operation should be performed just as systematically as in appendicitis. He believes that in acute cholecystitis there is no good reason for expectant treatment. The arguments for it are based on the supposed danger of operation and the removal of an organ the function of which is not

very well understood. Tytgat points out from collections of statistics that the mortality of early operation is from 3 to 10 per cent while that of late operation is 30 per cent. Thousands of patients have lived after cholecystectomy without any unfavorable effects. Moreover an infected gall bladder rarely recovers entirely and removal of calculi and drainage often lead to chronic infection which finally necessitates radical operation. After operation the patient should be turned over to the internist for medical and dietetic management, as his liver is still diseased.

In conclusion the author states that in diseases of the biliary tract close coöperation between the surgeon and the internist is particularly important.

AUDREY GOSS MORRIS, M.D.

Akerlund A.: Observations in Cholecystograms Made With the Patient in the Erect Position. A New Roentgenological Sign of Gall Stones (Beobachtungen bei Cholecystogrammen in aufrechter Körperstellung. Ein neues roentgenologisches Gallensteinersymptom) *Acta radiol.* 1933 XIV 74.

The author recommends serial cholecystograms made with a tube diaphragm, graded compression, and the patient in the erect position especially for the demonstration of small gall stones. Under such conditions large as well as small stones and radio-opaque and thinner stones will usually be found to have sunk to the fundus of the gall bladder. Tumor defects do not change their position. Neither do gall stones that are wedged in the upper part of the organ, and occasionally the presence of valvular formations in the gall bladder or of inspissated calcareous bile prevents the stones from sinking. Sometimes, but relatively seldom, medium-sized transparent gall stones remain suspended within the shadow of the gall bladder.

In five cases of very small transparent stones the author noted a new roentgenological sign of cholelithiasis in cholecystograms taken with the patient in the erect position. This consisted of stone defects forming, in the middle part of the gall-bladder shadow a horizontally suspended layer which remained constant in spite of changes in the patient's position and manipulation. Akerlund believes its explanation is to be sought in the presence within the gall bladder of bile fractions of unequal concentration (specific weight) which do not mix with each other and in the specific weight of the gall stones between the respective weights of these different fractions. He agrees with Ellarz that this stratification of dissimilar bile fractions may be an important factor in the pathogenesis of gall stones.

Burrows, H.: An Experimental Inquiry into the Association Between Gall Stones and Primary Cancer of the Gall Bladder *Brit. J. Surg.* 1933 XX, 607

By some clinicians, gall stones are regarded as causal agents of biliary cancer. The foundation for

this opinion is the frequency with which calculi are present in cases of primary carcinoma of the gall bladder and the alleged experimental production of cancer by the insertion of foreign bodies into the gall bladders of animals. However the frequency of the association of cholelithiasis with carcinoma of the gall bladder cannot in itself be regarded as proof that either condition has caused the other.

The general character of the results obtained in all of the experiments carried by different observers is uniform that is, the introduction of a foreign body into the gall bladder of a guinea pig or a rabbit produces at a very early stage a rapid and extensive proliferation of the various histological elements composing the affected viscous. This proliferation is accompanied by a penetration into the contiguous structures—the liver and adherent omentum—of the newly formed glandular and other elements derived from the gall bladder. This invasive process has been variously interpreted, some investigators having accepted it, especially when it is accompanied by the development of atypical epithelium, as evidence of malignancy, and others regarding it as compatible with a benign process. Some have called the condition precancerous. The author does not believe that the microscopical evidence hitherto brought forward to support the view that cancer has been produced artificially by gall stones is impressive. He states that the diagnosis of cancer in experimental work with animals requires further proofs than those supplied by the microscope. The malignant tumor infiltrates and destroys the neighboring structures, it is amenable to transfer by autografts or heterografts, it forms metastases, and unless treated, it progresses to kill the host. While not all of these criteria are essential to a diagnosis of malignancy, at least some of them should be present. In the experimental work done by the author not one of them substantiated the diagnosis of cancer.

In the study herewith reported gall stones introduced into the gall bladders of thirty three guinea pigs did not produce cancer. SAMUEL KAHN, M.D.

Bruckertz, W.: Animal Experiments on the Extra-hepatic Biliary Passages. I. Destructive Changes Caused by Pancreatic Ferments (Tier experimentelle Untersuchungen an den extra-hepatischen Gallenwegen. I. Pankreasferment-schaden). *Deutsche Zeitschrift für Chirurgie*, 1933, cccxviii, 141.

The author carried out experiments on rabbits to clarify the problem of non-perforative biliary peritonitis. By means of these experiments it was possible to study the acute destruction found in the familiar clinical picture of non-perforative biliary peritonitis in human beings. The findings proved that active sterile pancreatic extract alone even when retained in the biliary passages for twelve hours, is not able to damage the untraumatized wall of the biliary passages, but that when infection is added digestive necrosis of the walls of the biliary

passages occurs within a short time and biliary peritonitis ensues. Therefore a bacterial infection is of importance for activation of the ferment of the pancreatic juice introduced into the biliary passages.

The author summarizes his results as follows:

1. Neither an active sterile solution of pancreon tablets nor sterile beef pancreatic extract, which is stronger produced any evidence of digestive necrosis on the walls of the biliary passages when it was artificially retained in the biliary passages of the rabbit in quantities of 0.5 c.cm. for twelve hours. In the one instance in which digestive necrosis of the walls of the gall bladder appeared following the injection of what was believed to be sterile pancreatic extract it was later found that the extract which had been treated with toluol for twelve hours and used in the experiment was not sterile. When the extract was treated with chloroform before its injection digestive necrosis was never found.

2. When colon bacilli were introduced with the pancreatic extract into the biliary passages of the rabbit and the common duct was then ligated, digestive necrosis of the gall-bladder wall developed in every case, in one instance within five hours and in the others within twelve hours. The necrosis was followed invariably by biliary peritonitis without macroscopic or microscopic evidence of perforation. The extent of the digestive necrosis depended without question upon the fermentative activity of the pancreatic extract. For example the mildly active solutions of pancreon tablets produced only superficial digestive necrosis of the wall of the gall bladder without biliary peritonitis. This fact shows that not all parts of the wall of the gall bladder were involved in the necrotic process as yet, only the mucous membrane being affected. Very active pancreatic extract mixed with colon bacilli produced in one instance a very extensive necrosis of the entire gall bladder wall within five hours, while in another case necrosis was found only after twelve hours. Simultaneously with the appearance of the necrosis of the gall-bladder wall, biliary peritonitis developed without a microscopically demonstrable perforation. In these experiments the results were the same whether the common duct was ligated or stenosed in some other manner.

3. When pancreatic extract and colon bacilli were injected into the biliary passages of the rabbit and the biliary passages were not obstructed, no change in the sense of a digestive necrosis was found after either twelve or sixteen hours.

4. It was shown that in the experiments in which the injection of pancreatic juice and colon bacilli had caused an extensive necrosis of the gall-bladder wall, the wall of the common duct usually showed no changes, but occasionally presented similar changes localized at the site of the injection.

5. Control experiments with injections of sterile salt solution and colon bacilli yielded no evidence to indicate that it is possible to produce digestive necrosis of the walls of the biliary passages in this manner.

FLEISCH-TREIBER (Z)

Holman E., and Rallaback, O. C.: Partial Pancreatotomy in Chronic Spontaneous Hypoglycemia; with a Review of the Cases of Hypoglycemia Surgically Treated. *Surg. Gynec. & Obst.*, 1933, lvi, 591

The symptoms of hyperinsulinism vary directly in their severity with the insulin excess and the resulting hypoglycemia. They progress from weakness, nervous irritability, fatigability, extreme hunger, muscular twitchings, visual defects, unsteadiness of the gait, excessive perspiration and loss of emotional control to mental confusion, disorientation, convulsive seizures, syncope, and coma ending in death. Patients frequently discover that the ingestion of food may prevent attacks of symptoms.

Three surgical conditions have been found responsible for insulin excess: carcinoma of the islet of Langerhans, a benign tumor of the islets, and overactivity of a normal appearing pancreas comparable to hyperthyroidism due to hyperplasia of the thyroid. The authors review eight cases of insulin excess collected from the literature and report a case of their own.

Their own case was that of a man thirty-one years old who had been compelled to stop work on several occasions during the past year and a half because of pronounced weakness. After physical labor he became mentally confused and disoriented, often staggered and sometimes lost consciousness. After taking a cup of hot chocolate he recovered immediately. On one occasion he failed to awaken in the morning and could be aroused

only after food was administered. The attacks became increasingly more frequent until finally they occurred every two or three weeks.

Physical examination was negative. The attacks could be easily provoked by depriving the patient of food. During an attack the blood sugar was about 38 mgm. per 100 c.cm. After restoration of consciousness by the administration of food, it rose to 128 mgm. per 100 c.cm.

Thyroid extract and pituitary extract were given without benefit. Laparotomy revealed a normal appearing pancreas in which no abnormality could be palpated. An excised 8-cm. portion of the tail of the pancreas showed no anatomical changes. On the sixteenth postoperative day a mass appeared in the epigastrium. Drainage of the mass evacuated 1500 c.cm. of thick grayish fluid containing numerous bits of necrotic pancreatic tissue. After the operation the blood sugar remained low but the patient became able to perform a day's work without leaving it to eat.

In none of the three reviewed cases in which an adenoma was found was the tumor more than 2 cm. in diameter. The authors therefore believe it highly probable that in the cases in which resection of the pancreas showed no tumor formation the pathological changes were elsewhere in the gland. They suggest that when palpation fails to reveal the tumor removal of at least four-fifths of the pancreas be done. This could be facilitated by removing the spleen with the pancreatic tissue.

STANLEY H. MINTZER, M.D.

GYNECOLOGY

UTERUS

Graves, W P: The Detection of the Clinically Latent Cancer of the Cervix; with a Report on Schiller's Lugol Test *Surg., Gynec. & Obst.* 1933 lvi, 317

The combat against cervical cancer during the last thirty years has established the fact that this condition may be cured by the means at our disposal, but that the chances of cure are directly proportional to the timeliness of the attack. During the period cited we have been treating and studying cervical cancer in its advanced stages. Only a few incipient cancers have been detected and consciously treated, the discovery of a cancer in its early stages being usually accidental. And yet, since the incidence of incipient and terminal cancer is identical, patients must repeatedly be on our examining tables who harbor malignancy which is invisible to the keenest eye and intangible to the most sensitive touch.

The treatment of advanced cervical cancer by surgery, radiotherapy and the use of colloidal metals has reached an impasse.

In the search for early cases it must be recognized that the life history of cervical cancer averages from ten to twelve or more years and includes a long irritative stage of chronic cervicitis and a shorter though still protracted, stage of clinical latency during which the cancerous change, though actually present, does not attract the attention of the patient or her attendant. Until recently our best method of discovering cancer of the cervix in its latent stage has been timely repair of the inflamed cervix with biopsy. Many unsuspected cancers have been discovered in this way. However, the procedure has frequently led to error as the pathologist unfamiliar with the changes of incipient cancer may mis the diagnosis or the operator, with nothing to guide him may miss the cancerous area entirely in removing the tissue for biopsy. The invention of the colposcope by Hinselmann has proved of great aid.

It is evident that a clearer knowledge of the histological appearance of early cancer and a simple test by which the latent area may be accurately located for biopsy are essential. Schiller's effort to meet these requirements stands pre-eminent. From his histological studies Schiller drew the following conclusions

1. Cancer of the cervix starts in the squamous epithelium of the portio near the os and at first spreads laterally i.e., superficially

2. It starts in the unbroken epithelium and not in an ulceration

3. Histologically the chief factors determining the diagnosis are (a) the oblique line of demarcation between the normal and abnormal areas, and (b) the

anaplastic stypicality and polymorphism of the abnormal cells.

However, this histological revelation of the earliest appearance of cancer would be of little practical importance without the ability to discover the location of a process not distinguishable by sight or touch. To meet this difficulty Schiller devised an ingenious test based on the discovery by Lahn that the upper layers of the normal epithelium of the portio and vagina contain rich masses of glycogen which disappear when the epithelium becomes cornified and changed by cancer. In the normal living tissue the glycogen of the upper layer of cells is stained in a few seconds a deep mahogany brown by iodine in watery solution (Lugol's solution). A superficial area of early cancer, being devoid of glycogen, does not take the stain and stands out startlingly white or pink against the deeply colored almost black background of the normal tissue.

During a nine months period in which the author used this test on all cervixes examined in the operating room it revealed three early cancers which in respect to the Lugol test and the microscopic findings, corresponded to Schiller's dicta. In none of these cases was there tactile or visual evidence of cancer, and in the biopsy there was no guide to the location of the cancer except the Lugol test. Of 553 clinical cases, Schiller found the test positive in 240 and discovered an early cancer in 19 of the latter.

The test appears to be completely reliable when it is clinically negative, that is to say when all of the tissues take the normal stain. It is therefore specific for determining the absence of cancer of the portio and vagina. The examiner must be familiar with conditions that obscure the test. The stain does not take on glandular epithelium such as that of the endocervix or on the epithelium of an adenocarcinoma. Ulcerations and erosions do not take the stain as they have no epithelial covering. Trauma produced by tenacula or scrubbing with gauze prevents normal staining. Clean living granulations, hyperkeratosis leucoplakia, luetic lesions, and exposed areas in prolapse do not take the stain. A film of mucus, douche water and blood obscure the reaction.

In conclusion the author says that Schiller's test is specific for cervical cancer and is not adapted to other superficial cancers such as those of the vulva and the skin of other parts of the body

ANCE F. MAXWELL, M.D.

Warren S.: Studies on Tumor Metastases. I. Distribution of Metastases in Carcinoma of the Cervix Uteri *Surg. Gynec. & Obst.*, 1933, lvi 743

The distribution of metastases found at autopsy in 1059 cases of malignant disease was studied.

Only those autopsy protocols were used which afforded a satisfactory gross description and at least a fair clinical history. No case was included without a review of the microscopic slides. There were 132 cases of carcinoma of the cervix uteri. The average duration of low-grade epidermoid carcinomata (two and three tenths years) is twice that of high-grade epidermoid carcinomata and half again that of epidermoid carcinomata of medium malignancy.

The author emphasizes that histological grading is of but little value in the estimation of the prognosis in individual cases. Such factors as the extent of the local lesion, the presence of metastases, the age of the patient, and the type of treatment must be given due weight. Because of the tendency of highly malignant tumors to metastasize early and widely and to infiltrate deeply the results of radium irradiation of such tumors are very often as unsatisfactory as those of any other treatment. The difficulty lies, not in failure of the irradiation to affect the tumor but in failure of effective irradiation to include all of the malignant cells. In the cases reviewed the power of metastasis was most pronounced in tumors of Grade 3.

There is a close parallelism between the degree of malignancy and the total number of sites of metastasis of the tumors of given grade. Carcinomata of high malignancy average more than 3 sites of metastasis apiece, whereas those of low malignancy average less than 1 apiece.

Metastasis to bone is unusual in cancer of the uterine cervix, but in the cases reviewed it occurred 5 times—twice in cases of tumors of Grade 3 and 3 times in cases of tumors of Grade 2. The metastases were all of the osteoclastic type.

Eighty per cent of the metastases occurring after treatment appeared within one year. The length of life after treatment in most cases was short.

ROLAND S. CROW, M.D.

ADNEXIAL AND PERIUTERINE CONDITIONS

Plant, A.: Ovarian Struma. A Morphological, Pharmacological, and Biological Examination. *Am. J. Obst. & Gynec.*, 1933 xiv 351

The author reports three cases of ovarian struma. The specimens had the character of an ovarian teratoma. They all contained different tissues such as bone, nervous tissue, and mucinous glands. Pseudomucin was absent, and there were no histological signs of ovarian cystoma. Cystomata occur very frequently in the ovary and are often associated with dermoid cysts. Therefore it is not surprising to find a cystoma and a teratoma such as an ovarian struma in the same ovary. In the second and third cases reported by the author almost the entire tumor consisted of thyroid tissue. The thyroid tissue, the mucus-producing portions, and the carcinoma-like solid tumors were found side by side and even intimately mixed.

Chemical examination proved the thyroid character of the ovarian struma by demonstrating a

high iodine content. The Hunt acetonitril test showed that ovarian struma has the pharmacological effect of thyroid in proportion to its iodine content. The tadpole test also showed the tumors to contain thyroid substance.

In the discussion of this report, FRANK stated that the carcinomatous portion of such a thyroid struma need not cause the clinician great alarm even when ascites is present.

MOORE said that he had tested for iodine in three cases, but was unable to demonstrate even a trace.

GRIFF expressed the opinion that the condition is more frequent than is indicated by the number of reports in the literature.

EDWARD L. CORDELL, M.D.

Bozzi, B.: Ovarian Dysfunction, Hypoplasia, and Hyperinvolution and Their Relation to Tumors of the Female Genital Tract (*Difformità ovariche, ipoplasia ed iperinvolutione del loro rapporto coi tumori dell'apparato sessuale femminile*). *Folia gynecol.* 1933 xxix, 339

The author presents a clinical and statistical review of 443 cases of genital lesions, 245 observed in the Clinic at Parma and 201 at Pavia in the period from 1923 to 1930. The lesions studied were as follows: fibromyomata, 221 (subserous or subperitoneal, 81; intramural, 118; submucous, 22); carcinomata of the portio and of the cervical canal, 50; adenomata and carcinomata of the body of the uterus, 17; tumors of the adnexa, 130; and multiple tumors, 35. Many of the interesting lesions are shown by photographs of the gross specimens.

From his very detailed study Bozzi concludes that in cases of tumor of the female genital tract the local constitutional factor whether it is anatomical or functional, congenital or acquired, varies in importance with the type of the neoplasm. In the cases of uterine fibromyomata there were frequently signs of ovarian hypofunction and dysfunction dating from the age of puberty and the incidence of sterility and uterine hypoplasia was high. These facts led Bozzi to conclude that the ovarian changes found so frequently in cases of fibromyoma represent degenerative changes antedating the development of the tumor. Fibromyoma occurring with senile hyperinvolution is very rare. Bozzi found no case of hyperinvolution in women of the child-bearing age.

When fibromyomata develop in the uteri of sexually healthy multiparae it is easy for them to take on a submucous growth (probably because of the greater size of the cavity of the uterus and the greater laxity of the uterine tissues) whereas in nulliparae, especially those with hypoplasia, they tend to develop toward the external surface and become subserous or subperitoneal.

In cases of ovarian tumors the incidence of hypoplasia and dysfunction of the ovaries dating from puberty is quite high. It varies with the type of tumor. It is highest in cases of papillary tumors

and high in those of dermoid cysts. In cases of ovarian cysts the incidence of hypofunction and dysfunction dating from puberty is high but the incidence of hypoplasia is about equal to that usually found in ordinary gynecological material.

In cases of cancer of the cervix and corpus of the uterus true hypoplasia is rare, but the incidence of hyperinvolution is noteworthy.

Buxi believes that congenital endocrine factors or factors acquired before puberty which produce hypodevelopment or dysfunction of the genital system may predispose to the development of uterine fibromyomata and proliferating ovarian tumors. The high incidence of sterility in women with fibromyomata is probably due to the same cause. In women whose genital system is constitutionally sound the exaggerated and precocious involution of the uterus is an index of the exaggeration of the endocrine stimuli which act after lactation and after the menopause may predispose to or be associated with the development of cancer. This difference of behavior may explain the well known possibility of regression of fibromyomata after the menopause, a phenomenon which has never been noted in carcinoma. ROBERT T. LEWIS, M.D.

Meigs J V and Hoyt W F: Rupture of the Graafian Follicle, the Corpus Luteum and Small Follicle, or Lutein Cysts Stimulating Appendicitis. *Am J Obst & Gynec.*, 1933 xiv 532

When in a case presenting symptoms suggestive of appendicitis the patient is a young woman who has not borne children, has not had an abdominal operation, has suffered previous similar attacks, and the physical signs do not seem consistent with the severity of the pain and the tenderness the possibility of rupture of the ovary should be considered. Suggestive of rupture of the ovary are sudden onset of pain, a low temperature, a slightly elevated pulse and a low leucocyte count out of proportion to the pain. An intelligent interpretation of the history and physical findings in cases of ovarian rupture is very important as rest in bed and careful observation may prevent an unnecessary operation for assumed mild acute appendicitis.

EDWARD L. CORNWELL, M.D.

EXTERNAL GENITALIA

Hubbert, G F: The Significance of the Streptococcus in Trichomonas Vaginalis Vaginitis. *Am J Obst. & Gynec.*, 1933 xiv 465

In the cases of many women the trichomonas vaginalis may be present in the vaginal secretions for long periods of time without producing acute vaginitis. In a large percentage of the cases in which it is present with acute vaginitis there is an associated predominant growth of a gram positive non hemolytic streptococcus in short chains. This type of streptococcus is capable of producing active vaginitis in the absence of the trichomonas vaginalis.

When a specific streptococcal bouillon filtrate is applied to the vagina repeatedly the active growth of the organisms in the vagina die off and the active vaginitis subsides in spite of persistence of the protozoon in the secretions.

The technique of the preparation of the bouillon is described. EDWARD L. CORNWELL, M.D.

MISCELLANEOUS

Schanflier G C. and Kuhn C. Information Regarding Gonorrhea in the Immature Female. *Am J Obst & Gynec.* 1933 xiv 374.

The difference in the pathogenic action of the gonococcus on the genital organs of female infants and small children as compared with adults is due to mechanical and developmental differences between the immature and mature female genitalia. The glands of Skene and Bartholin do not achieve sufficient complexity to harbor infection until about the age of puberty. The racemose glandular system of the endocervix is very slow to develop frequently being apparent only as scattered rudimentary blunt, glandular crypts up to as late as the fifteenth year. The immature vagina is merely a potential cavity held in a state of constant closure by its elastic and muscular coat and replete with stagnant crypts and rugae. Its walls are held tenaciously approximated, in marked contrast to the flattened gaping vagina of the parous woman.

The contracted cryptiform rugose vagina of the immature female constitutes an ideal harbor of infection. The vaginal cervix is the site of deep pleats and folds similar in all respects to those noted throughout the remainder of the vaginal wall. Thus the vaginal cervix is not exempt from an infection involving the entire vaginal wall.

Douches, instillations, and injections have been used empirically and ineffectually for many years. These measures, which are mildly effective in certain involvements occurring in the adult, are grossly inadequate to meet the requirements in any but virtually self-limited cases. The use of plain anhydrous lanolin incorporating an appropriate concentration of an effective antiseptic is advised. The authors use 1 per cent silver nitrate. The ointment should not be warm as firmness facilitates distention of the vagina with the use of mild intra vaginal pressure. Moreover cold ointment is more easily and completely retained and has the highest possible fluid affinity which makes it a highly effective vehicle for carrying the antiseptic into the moist vaginal wall. EDWARD L. CORNWELL, M.D.

Argentino, A.: Morphological Research on the So-Called Presacral Nerve with regard to its Practical Application (Ricerche morfologiche sul cosiddetto nervo presacrale con riguardo alle applicazioni pratiche). *Arch. di anat. e ginec.* 1933 xi, 21

In 1912 Stricker reported that both coeliac and hypogastric plexuses are to be seen in embryos of

16 mm. They differ from those of the adult only in the fact that cell differentiation is incomplete. In 1921 Bromann found that in embryos of 70 mm. large groups of ganglion cells are arranged ventral to the abdominal aorta. In 1929 Flächel reported the development of a parasympathetic nucleus of the cord extending from the third lumbar segment to the caudal termination.

From the standpoint of comparative anatomy the author finds it difficult to establish an exact correspondence between the formation in man and in animals, largely because of the confusion in the nomenclature. It seems to him certain however that such a correspondence exists, but with a difference between the male and female.

The author's studies were made on sixty subjects—fifty adult females and ten newborn infants of both sexes. It was found that the hypogastric plexus may appear in the following four forms:

1. A large-meshed nervous network formed by the confluence and bifurcation of nerve branches and adherent to the anterior surface of the sacrum by means of connective tissue.

2. Two lateral branches approaching the median line at the fifth lumbar vertebra, running together, and dividing again on the body of the first sacral vertebra.

3. Three roots united by connective tissue but easily separated.

4. A true single nerve formed from two cords of the lateral roots and from the median root and lying in front of the bifurcation of the large vessels.

Only macroscopic examinations were made. The parasympathetic was studied in ten fetuses, but this number is not considered sufficient for a statistical report.

In experiments carried out on dogs in 1928 Caporale found that resection of the hypogastric plexus resulted in dilatation of the bladder.

From an experimental study of pelvic pain in women the author was unable to draw any conclusions.

On the basis of morphology Argentine concludes that only the transperitoneal route can be effective, and that the operation of choice is resection of the presacral sympathetic nerve. However even when this is done there still remains a sympathetic communication by way of the spermatic plexus, the ureters, the pelvic plexus, and the lateral roots of the parasympathetic nerve. A. E. Tarr, M.D.

Petri, H. H. W.: Death from Air Embolism Following Criminal and Therapeutic Interference with the Genitalia (Ueber den Tod durch Luftembolie nach kriminellen und therapeutischen Eingriffen in die Genitalia) 1923 Leipzig, Dissertation.

This article is based on 32 cases of death from air embolism induced by criminal and therapeutic manipulations of the genitalia. Some of the cases were observed by the author himself and others were collected from the literature. Most frequently the embolism occurred at the time of this

interference, but there were 2 instances of protracted air embolism. Among 60 cases of criminal abortion occurring in a period of three years which were reported by Strassmann there were 5 deaths which were definitely the result of acute air embolism and 1 death from questionable protracted air embolism. Other examples from the literature were 1 case reported by Richer 1 by von Sury 2 by Walcher 1 by Weissenrieder and 3 by Ziemke.

In some cases the cerebral form of air embolism dominates the clinical picture, as brought out by Strassmann, Schmidt, and Walcher. It is assumed that the occurrence of cerebral air embolism requires an open foramen ovale.

All but 1 of the cases reported were cases of criminal interference, and it seemed that the usual procedure was the injection of a fluid by means of a rubber bulb syringe. The embolism was produced by the residual air in the carelessly filled syringe which was forced into the uterus under high pressure. However air embolism may result also from obstetrical manipulations or therapeutic measures as in the cases of placenta previa reported by Kramer, Krukenberg, Heuck, Boss, Lense, Zorn, Huehl, Schulz, Vavra, and Esch.

The first proved case of air embolism following a cesarean section was reported by Koeester in 1905. Other cases have since been reported by Flak, Latsko, Deuschel and Rau. In 228 cervical cesarean sections at the St. Gall Obstetrical Institute there was only 1 death ascribed to air embolism. Van Gloppo reported a case in which air embolism occurred on the second day following a forceps operation. In another case autopsy showed that death was caused by the entrance of air into the opened veins about the bed of a myoma which had just been enucleated. No deaths from air embolism following the perturbation operation of Seiffert have been reported, but Engelmann and Schallehn have observed characteristic symptoms of embolism, such as collapse, cyanosis, labored breathing, and small, irregular pulse, after this procedure.

The author cites from the literature also 3 cases in which sudden death occurred from air embolism following manipulation of the urinary bladder. In the first case the air entered directly into an ulcerated vein. In the 2 others fatal air embolism followed the injection of air into the bladder. Experimental work done by Ziemke, Flächel, and Richter on rabbits, by Hare, Pirogoff, Laborde, Muron, Uterhard, Gaertner, Pomet, and Delore on dogs, and by Chaveau, Richter, Lions, and Cardiot on horses has demonstrated that when the air is injected slowly enormous amounts may be tolerated without harmful results, but when it is injected rapidly even small quantities may cause death (Pirogoff, Laborde, Muron, and Ilyin).

In the Trendelenburg position the femoral and hypogastric veins may also aspirate air.

Schallehn studied the extirpated human uterus to determine the amount of pressure necessary to demonstrate permeability of the tubes, and, at the

same time, the amount of pressure necessary to induce entrance of the air into the venous system. He discovered that even when the tubes were permeable the air under pressure of 120 mm. Hg or higher would bubble up from the submerged uterus, not only from the surfaces immediately beneath the fornices, but also from deep down about the internal os. This leakage of air occurred by way of the spermatic veins and the great vessels of the uterus. In the uterus the air penetrated the venous system when it was injected under a pressure of only 70 mm. Hg. In the cases of carcinoma of the portio no air could be forced into the venous system. Following curettage, however, air entered when under a pressure of from 100 to 120 mm. Hg. It is assumed that when the air enters the circulation rapidly the minimal fatal amount in clinical cases is 40 c.cm.

Ziemke gives the following explanation for the protracted form of air embolism. The lower pole of the amniotic sac is at first loosened by the air containing injected fluid only over a small area and without the opening of a large number of veins. Expulsion pains, contraction of the pelvic musculature, and movements of the body result in partial separation of the placenta from the wall of the uterus and the opening up of the extensive venous field of the placenta. As a consequence, the air contained in the cavity of the uterus enters the inferior vena cava and the right side of the heart in large amounts.

Walcher assumes that the air enters the veins at the time of the intrauterine injection, but is held

up at first in the tortuous veins of the pelvis until later, when it is mobilized by muscular action, particularly that of the pelvic floor, and is carried to the right side of the heart.

Amreich assumes that when air embolism occurs in cases of placenta prævia the air which entered the uteroplacental veins at the time of the operation is aspirated into the uterovaginal plexus and the uterine and hypogastric veins. Opitz states that when air penetrates between the uterus and the placenta during the preparations for version in cases of placenta prævia, the buttocks of the child may press the placenta against the wall of the uterus and thus force the air, which has become caught between the placenta and uterine wall, into the vessels. It is generally assumed that the death which results from air embolism originating in the uterus is a cardiac death. To prove that air embolism was responsible for death it is necessary to perform an autopsy immediately.

The first observation of air embolism was reported in 1806 by von Verrier who noted the penetration of air into the venous system of a horse during phlebotomy. A few years later Beauchaine observed a case of air embolism following the penetration of air through a hole in the subclavian vein during the extirpation of a tumor of the clavicle. Lionet reported air embolism originating in the uterine vessels. A similar case was reported by Olshausen in 1864. In 1804 Freudenberg called attention to the dangers of air embolism.

HAUMANN (Z)

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Solomons, B.: The Prevention of Maternal Morbidity and Mortality *Irish J. M. Sc.*, 1933, N 88 p 171

Maternal mortality and morbidity have been the subjects of much investigation, but are still high because of, among other factors, ignorance on the part of the members of medical profession. Unless every death associated with childbirth is analyzed carefully statistics are very misleading. In 8,333 labors on an intern service which are reviewed by the author there were 58 deaths, a mortality of 0.73 per cent. The most common cause of death was sepsis, which was responsible for 10 fatalities. Solomons believes that throat infection in attendants has very little to do with puerperal sepsis and maternal mortality ALBERT W. HOLMAN M.D.

Stutz, S.: The Etiology of Cervical Placenta (Zur Ätiologie der cervicalen Placenten) *Monatsschr. Gynäk.* 1932 4, 70.

The works of Stieve have proved without doubt that the uterus consists of three parts. The cervix may be considered to extend only from the lower boundary of the isthmus to the external uterine os. Therefore only twenty three of the forty three hitherto published cases of cervical placenta may be designated as such, and five of these must be considered cases of dissecting cervical placenta.

The author reports two cases of true cervical insertion of the placenta. In one, the condition resulted in miscarriage in the third month and in the other in the sixth month. The cervical attachment was proved by digital separation. The placenta extended from the external uterine os to the isthmus and was organically connected with the wall of the cervix. Palpation of the uterine cavity showed it to be entirely smooth, without any evidence of attachment. Histological examination of the cervical tissue demonstrated the penetration of chorionic villi into the wall of the cervix. In both cases sudden hemorrhage with miscarriage occurred without warning. In spite of immediate medical attention the loss of blood almost proved fatal. After successful treatment of the extreme anemia and removal of the adherent cervical placenta recovery was smooth. Both women had pronounced hyperthyroidism. The disturbance of the endocrine balance caused an increase of the sympathetic tone. The latter produced an increase in the peristalsis of the uterine corpus and dilatation of the uterine os. As a result of such changes the fertilized ovum reaches the lower portion of the uterine cavity quickly and clings to the isthmus or the cervix, or leaves the uterus before it is ready for nidation. Similar re-

sults may be produced by an increase in vagus tone, which causes relaxation of the uterine musculature and gaping of the uterine os.

Therefore the tonus changes of the sympathetic nervous system are of fundamental importance not only in placenta previa, but also frequently in cases of habitual abortion and sterility. A study of all cases of these conditions from this point of view will perhaps lead to better treatment and efficient prophylaxis. E. GOLDENKRON (G).

Reeb: The Treatment of Placenta Previa at the Straßburg Obstetrical and Gynecological Clinic During the Years from 1920 to 1932 and Its Results (Le traitement du placenta previa à la Clinique de Gynécologie et d'Obstétrique de Strasbourg pendant les années 1920 à 1932 et ses résultats) *Bull. Soc. d'obst. et de gynec. de Par.* 1933, xxi, 106.

During the thirteen years from 1920 to 1932 101 cases of placenta previa were found in a series of 18,307 deliveries at the Straßburg Obstetrical and Gynecological Clinic. Accordingly the incidence of placenta previa was 1 case in every 180 deliveries or 0.55 per cent.

The choice between delivery by the vaginal or abdominal route depended upon the condition of the patient. Vaginal methods of delivery had a maternal mortality of 13 per cent and a fetal mortality of 57.3 per cent. The obstetrical methods employed were: rupture of the membranes, 8 cases; introduction of a balloon after rupture of the membranes or perforation of a central placenta previa, 20 cases; Brantson-Hicks version, 11 cases; version and extraction or forceps delivery after complete dilatation, 18 cases and the Delmas procedure, 4 cases.

Surgical methods of delivery had a maternal mortality of 8.5 per cent and a fetal mortality of 50 per cent. The following surgical methods were employed: Duchesne's vaginal hysterotomy, 1 case; classical caesarean section, 3 cases; low caesarean section, 32 cases and subtotal hysterectomy after low caesarean section, 2 cases. In the author's opinion, low cervical caesarean section is the surgical procedure of choice. The morbidity following surgical intervention was somewhat greater than the morbidity following delivery by obstetrical methods, but Reeb points out that this was due in part to the fact that surgical procedures were used in the more serious cases. He believes that caesarean section should be performed for placenta previa more frequently than has been the custom in the past, but he does not favor its application to all cases.

The type of the insertion and the condition of the patient are important factors to be considered in

the choice of intervention. Pre-operative blood transfusion should be done in all cases in which there has been a marked loss of blood. The indications for surgical treatment are (1) severe hemorrhage regardless of the type of placenta prævia (2) rigidity, impermeability and lack of effacement of the cervix, and (3) a living fetus (fetal death is not a contra indication if the hemorrhage is profuse). The contra indications to surgical intervention are (1) the possibility of easy and rapid delivery after rupture of the membranes and (2) a non viable or dead fetus in the absence of profuse hemorrhage. Infection, vaginal tamponade and repeated vaginal examinations do not contra indicate surgical intervention.

HAROLD C. MACK, M.D.

Keller R. Results of the Treatment of 100 Cases of Placenta Prævia Observed at the Strassburg Maternity Hospital in the Period from 1920 to 1932 (Résultats du traitement de 100 cas de placenta prævia observés à la Maternité de 1920 to 1932) *Bull. Soc. d'obst. et de gynec. de Par.* 1933 *XXII*, 215

Among 19,568 obstetrical cases at the Maternity Hospital at Strassburg during the years from 1920 to 1932 there were 100 cases of placenta prævia. In 88 cases delivery was effected by the vaginal route with a maternal mortality of 6.8 per cent and a fetal mortality of 54.5 per cent, and in 12 cases it was effected by cesarean section with no maternal mortality and a fetal mortality of only 8.3 per cent.

In 16 cases of central placenta prævia with delivery by the vaginal route there was a maternal mortality of 15.4 per cent (4 deaths due to acute hemorrhage) and a fetal mortality of 84.6 per cent. The author is of the opinion that if the indication for cesarean section had been extended to include all cases of central placenta prævia the maternal deaths from acute hemorrhage would have been prevented and the fetal mortality would have been considerably lowered.

In 40 cases of lateral placenta prævia in which delivery was effected by obstetrical procedures there was a maternal mortality of only 4.9 per cent and a fetal mortality of 50 per cent. The author believes that cesarean section might have saved a mother who died from hemorrhage, although the mortality of 4.9 per cent corresponds closely to that of cesarean section in general. He is of the opinion also that cesarean section in this group of cases would certainly have lowered the fetal death rate. He favors the more frequent use of cesarean sections in such cases for fetal indications.

In 22 cases of marginal placenta prævia obstetrical procedures gave good results. There were no maternal deaths and the fetal mortality was 22.7 per cent.

Since it is not always possible to make a definite diagnosis of the type of placenta prævia the choice of treatment to be employed must be determined from the amount of hemorrhage and the general condition of the patient. The author concludes

that an extension of the indications for cesarean section would result in a decrease in the maternal and fetal mortality. However he does not favor the indiscriminate use of this operation in all cases of placenta prævia as in from 20 to 30 per cent of cases delivery will occur spontaneously after artificial rupture of the amniotic sac with results which compare favorably with those obtained in normal cases. The relative infrequency of cesarean section in the cases reviewed is explained by the fact that this operation was never performed at Strassburg for placenta prævia prior to 1926.

HAROLD C. MACK, M.D.

Mahon R.: Should Fibromata Becoming Necrotic During the Course of Pregnancy Be Operated Upon? (Faut-il opérer les fibromes nécrobloies au cours de la grossesse?) *Bordeaux chir.* 1933 No 18

Most surgeons are agreed that fibroids which become necrotic during the course of pregnancy should be treated by myomectomy or hysterectomy. Many obstetricians are of the same opinion but the author maintains that the majority of women with such fibroids can get well without operation and will not even suffer spontaneous abortion or premature labor if they are treated expectantly with bed rest and the application of ice bags.

Characteristically fibromata may hypertrophy, soften and then become necrotic in the course of pregnancy. Judging from statistics such as those of Pinard (84 of 14,000 deliveries in six years at the Baudelocque Clinic complicated by fibromata) this complication is rare. However the author believes that it is far more common than is suspected often escaping diagnosis because of the absence of symptoms. In support of this opinion he quotes Leroux and Barthélemy. Of the 84 patients whose cases are included in Pinard's statistics only 4 required surgery 5 had a spontaneous abortion 13 had a premature delivery and 66 had no symptoms at all.

Mahon believes that even complete necrosis of a fibroid can occur during pregnancy without causing clinical signs. He cites a case reported by Surcou and Job, that of a primipara thirty-one years of age in which the presence of a fibroma was diagnosed early in pregnancy and at term a low cesarean section was done because of failure of the head to engage. Operation revealed a completely necrotic mass containing yellow putrid liquid although the patient had no symptoms referable to a necrotic fibroid during the gestation. Mahon cites also a case of his own in which a necrotic fibroid was found at hysterectomy for placenta prævia at term although the patient had complained only of vague abdominal pain in the third month of pregnancy. He believes that necrotic fibromata become absorbed or calcified after delivery without causing symptoms.

While Mahon has observed also many cases (he does not state the number) of necrosis of a fibroid during pregnancy in which the condition was accompanied by pain tenderness and elevation of

the temperature he has never seen a grave complication. He cites the case of a primipara who had attacks of pain diagnosed as due to a necrotic fibroid after two and a half three and a half five and seven months of pregnancy. Each attack was relieved by bed rest and the application of ice.

The author strongly condemns radiotherapy for fibromata during pregnancy as it is dangerous to the fetus and itself favors necrosis. He characterizes abortion as a foolish procedure as it saves the pathological lesion and destroys the normal pregnancy. He states that if any intervention is to be undertaken, it should be surgery. The only operations to be considered are hysterectomy and myomectomy. Hysterectomy has a mortality of 2.5 per cent and sacrifices both baby and uterus. Myomectomy allows continuation of the pregnancy but has a maternal mortality of from 4 to 5 per cent and a fetal mortality of from 15 to 25 per cent. Mahon calculated the fetal mortality by averaging the mortality rates reported by Turner Bar Brin den, Cotte, Creysel and Labey Denis Leroux and Barthélemy. He states that, according to his experience, medical management with bed rest and the application of ice has no mortality.

He concludes with the statement that the majority of women with symptoms of necrosis of fibroids during pregnancy get well under medical management and that myomectomy or hysterectomy should be done during pregnancy only when there are menacing symptoms such as those due to torsion of a pedunculated fibroid or threatened rupture of the uterus.

JOSEPH T. GAULT, M.D.

LABOR AND ITS COMPLICATIONS

Phaneuf, L. E. The Scar of Low or Cervical Caesarean Section. *Am J Surg* 933 23 1

The low or cervical caesarean section is becoming increasingly popular. It results in a stronger and better scar and is followed less frequently by rupture in subsequent pregnancies and labors.

In 1931 the author reported 418 consecutive cervical sections. These included 105 repeated operations. One hundred and one of the scars were solidly healed and could not be identified by the naked eye. Of the four scars which were defective, 3 were very thin and 1 which had been extended in the uterine body because of large size of the fetus, was solid in its cervical part but thinned out for an area measuring 2.5 by 2.5 cm. in its corporeal portion. In the series of 418 cases there were no ruptured scars. Eleven women had 14 pelvic deliveries.

Four of the women who had cervical caesarean sections were subsequently subjected to hysterectomy. Two of them had 1 caesarean section with a longitudinal incision in the lower segment. 1 had had 3 cervical caesarean sections, the first with a longitudinal incision and the second with a transverse incision and 1 had a vaginal caesarean section and then a transverse cervical caesarean section.

Macroscopically, the cervixes showed firm and satisfactory healing. Microscopically it was found that the healing had taken place by scar tissue and there were no weak spots in the incisions.

CHARLES F. DU BOIS, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Pyrah, L. N., and Oldfield, C.: Puerperal General Peritonitis. *J Obst & Gynec Brit Emp* 1931, 4, 3

Pyrah and Oldfield state that general peritonitis is one of the most serious catastrophes which can befall a woman during the puerperium. In every case of puerperal infection the possibility of the development of peritonitis must be considered. If the infection of the peritoneum extends from the diaphragm to the pouch of Douglas and from loin to loin when it is first diagnosed the patient will not recover. However, if a diagnosis of spreading peritonitis be made before the peritoneal involvement has become general, an immediate operation for drainage of the abdomen offers a fair chance of recovery. The authors believe that the incidence of puerperal peritonitis is not sufficiently recognized by physicians, and that this condition is the most common cause of death in puerperal fever.

Thirty-six cases of general peritonitis occurring in the puerperium are reviewed. Twenty-five were fatal. In 7 cases operation was not undertaken because the patient arrived at the hospital almost moribund. Six patients survived less than twenty-four hours after operation.

The cause of peritonitis during the puerperium is a streptococcal infection of the genital tract occurring at or about the time of abortion or parturition. In hospitals, infection by contact with an already infected case is sometimes responsible for a series of cases of increasing virulence. The virulence of an organism which is transmitted in succession through several individuals of such a series gradually increases from case to case. In the first patient the infection will be mild while in the second rigors may occur. In the early cases recovery results. In later cases the infection leads to septicaemia, which is often accompanied by peritonitis and is fatal or followed by recovery only after a prolonged illness. Puerperal peritonitis is closely related to delivery by forceps and other intra-uterine manipulations. In nearly one-third of all cases of puerperal peritonitis there has been some intra-uterine interference.

Peritonitis is a more frequent complication of labor than of abortion. The infecting organism is more often the staphylococcus and bacillus coli than the streptococcus. Infection with the former causes a localized peritonitis rather than a diffuse infection of the abdominal cavity. In cases of abortion, localization of the infection in the pelvis is facilitated when the uterus is situated in the pelvic cavity.

In early cases in which the peritonitis develops during the first four days after labor, the peritoneum is invaded by highly virulent organisms transmitted

from the infected endometrium by way of the lymphatic plexuses in the uterine wall. In such cases the condition runs a very rapid course characterized by severe toxæmia and usually by the absence of local inflammatory lesions in the pelvis. Frequently a bacteræmia is present. The prognosis is grave. In cases in which the peritonitis develops several days or weeks after parturition, local inflammatory lesions in the pelvis, situated in the wall of the uterus, the broad ligament or the ovary are very common. Peritonitis is set up by the sudden rupture of an abscess in the pelvis, slow permeation of the invading organisms through the wall of the abscess to the peritoneum, or bacterial invasion of the peritoneum by way of the uterine lymphatics. There is no bacteræmia. In cases of this group the prognosis is more hopeful than in cases of early peritonitis.

In the most acute cases of peritonitis the endometrium shows very little evidence of inflammation. In less severe cases a putrid endometritis may be found, especially when a mixed infection is responsible for the condition. In cases in which the peritonitis has been caused by extension from a local lesion two or more weeks after labor, the endometrium presents an almost normal appearance. The uterine muscle is softer than normal. The lymphatic infection of the uterus is often manifested by microscopic areas infiltrated by round cells. It is not uncommon to find a macroscopic abscess either at operation or autopsy. An abscess in the uterine wall is nearly always situated at one or the other cornu. This is readily explained by the lymphatic distribution. The peritoneal coat of the uterus is often colored with a green, adherent layer of purulent lymph which, when peeled off, leaves a bleeding shaggy surface. The broad ligament is often altered, while the fallopian tubes and ovaries are infected and often slightly enlarged and oedematous. The tubes are never sealed, and in none of the cases reviewed was there a pyosalpinx in the puerperium.

The peritoneal inflammation varies greatly. In the most severe cases the serous coat of the intestine (particularly that of the coils in the pelvis and the lower abdomen) is more infected and is stippled with tiny specks of subperitoneal hemorrhage, while here and there are deposits of fibrin and lymph. There is either no pus or only a small amount of turbid blood stained fluid in the pelvis. Such a condition denotes an infection by highly virulent organisms with only the feeblest of reactions on the part of the peritoneum. It is almost uniformly fatal. In the majority of cases the formation of pus is more obvious. The pus may be seropurulent, fibrinopurulent, frankly purulent or of a gummy character. Its character depends on the virulence of the organism and the duration of the peritonitis. The pus spreads upward through the abdomen from the pelvis, collecting in pools here and there between the coils of the intestines. The intestines are greatly distended with gas and covered with a shaggy coating of lymph in patches which can easily be stripped.

Occasionally two or three coils are glued together with plastic lymph.

It is often stated that puerperal general peritonitis is always associated with septicæmia and is invariably fatal. If the peritonitis is regarded as a terminal event in a puerperal blood infection the tendency will be to withhold surgical treatment, but if it is regarded as the result of an infection spreading from the uterus or a local lesion in the pelvis early diagnosis and surgical treatment become of the greatest practical importance. The authors believe that the association of peritonitis and septicæmia is not so common as has been supposed, and that peritonitis developing after the first few days of the puerperium is usually not associated with a blood infection but is the result of infection spreading from a local lesion in the pelvis and therefore amenable to early treatment. In a large number of cases, puerperal peritonitis is a local disease, and not a focal manifestation of a septicæmia as has so often been stated.

The symptoms and signs of puerperal general peritonitis vary considerably. In cases in which the condition develops within the first three or four days after parturition the patient is nearly always already acutely ill with puerperal fever. The onset of peritonitis in such cases is marked by a change for the worse in the general condition. Occasionally the symptoms and signs referred to the abdomen are so few that the peritonitis may not be discovered until autopsy is done. More frequently, the development in the first stages of the illness of a few symptoms and signs suggesting an acute abdominal disturbance permits a diagnosis to be made before death. In cases in which the general peritonitis develops several days or several weeks after parturition there has often been very little evidence of puerperal infection until the sudden appearance of the peritonitis. In such cases there are not only marked constitutional changes but also very definite symptoms and signs of an acute abdominal catastrophe. Between these two extreme types are cases of every grade of severity.

Typically the onset of puerperal peritonitis is manifested by a triad of symptoms—a rigor abdominal pain, and a marked increase in the pulse rate. The abdominal pain usually accompanies the initial rigor. In the majority of cases it is very severe and sometimes even agonizing. With the rigor the pulse rate rises to 120 or higher. The respirations are increased in rate. The appetite is lost from the beginning of the illness. Vomiting is not a constant feature. Constipation is usually present, but in some cases, diarrhea is an important early symptom and may favor a fatal ending by causing painful tenesmus and dehydration. Painful micturition and not uncommonly acute retention may occur. In cases in which peritonitis begins soon after labor the flow of milk may never appear or is suppressed. The patient seems very ill, and soon after the onset of the condition has an anxious expression. Her eyes are hollow and her cheeks sunken. She lies flat on her

back with her legs drawn up and is quite still. The tongue, at first moist and of normal color later acquires a white coating and still later becomes dry and brown. If the patient lives for five or six days the teeth and lips are covered with sordes. Rigidity can usually be detected over the lowest part and the center of the abdomen, but may be present to a greater extent. Tenderness of the abdomen is frequently found. Distention is noticed early and when the walls of the abdomen are thin the outline of coils of intestines may be seen. Vaginal examination discloses tenderness in the pouch of Douglas. On bimanual examination pressure over the uterus causes pain while the presence of the local lesion, a uterine abscess or tumor may be felt.

Early diagnosis is of the greatest importance. The authors believe it should be possible for the clinician to make a correct diagnosis with much greater frequency than is done at present as so often the patients are already under observation for puerperal pyrexia when peritonitis supervenes.

The authors are of the opinion that operative interference is essential in all cases of general puerperal peritonitis due to any organism other than the gonococcus. They have found no reliable evidence of spontaneous recovery in such cases. Operation should be performed as soon as the diagnosis is made even though the patient appears very ill. Anesthesia is best induced with ether by the open method. The primary purpose of the operation is drainage of the peritoneal cavity. In every case the drainage should be established by the abdominal route in order that exploration can be done. If drainage is established by the vaginal route alone the pelvic organs cannot be carefully examined and occasionally an extra pelvic origin of the peritonitis may escape recognition. Moreover adequate drainage of the general peritoneal cavity cannot be obtained. However drainage by the vaginal route is of value as a subsidiary method. If a focus of localized pelvic suppuration is found it must be removed or free drainage must be provided. If an abscess is present in the wall of the uterus or in the broad ligament, it should be

rapidly packed off with gauze and opened with the finger or a sinus forceps, and the pus within soaked up with moist gauze swabs. A second drainage tube should be introduced into the abscessed cavity if the latter is large enough and brought out through the abdominal wound.

The authors believe that, except in cases of infected fibroids, hysterectomy should never be performed in the presence of puerperal peritonitis, not even when an abscess is present in the uterine wall. By the time puerperal peritonitis is established, the entire pelvic lymphatic plexus is infiltrated with streptococci and hysterectomy will by no means remove the site of the organisms. On the contrary it will expose new lymphatic vessels and tissue spaces for further absorption of organisms and thus precipitate a fatal issue. Cutting across an infected lymphatic pathway in the absence of gross pus formation is strictly against surgical principles.

Occasionally a non-pelvic cause, such as a gangrenous appendix, will be found responsible for the peritonitis.

The operation should be performed as speedily as possible and all precautions should be taken to prevent shock. In the cases of patients who are very ill, it is sometimes advisable to give an intravenous saline infusion and delay operation for an hour or two after the patient's admission to the hospital.

The authors have not found the administration of intravenous antiseptics or antistreptococcal serum of any value. In cases in which severe vomiting or diarrhoea occur 30 c.c.m. of a 10 per cent sodium chloride solution should be given intravenously to replace the chlorides lost from the body.

The drainage tubes should be shortened after twenty-four hours and removed as soon as drainage has ceased. When localized suppuration has occurred, one tube should be left in place for a longer period. After removal of the tubes a careful watch must be kept for the development of residual abscesses. Residual abscesses must be drained as soon as they are recognized.

J. THORNWELL WYTHESPOON, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Chabanier Lobo-Onell Marchant and Donoso-Barthet. A Study of Ten Severe Cases of Acute Mercurial Nephritis. Considerations of a Physiopathological and Therapeutic Nature (*Étude de dix cas de néphrites mercurielles aiguës graves. Considérations d'ordre physiopathologique et thérapeutique*) *J. d'uról méd. et chir.*, 1933, xxiv 36

In ten cases of acute nephritis due to mercury poisoning the authors studied the chloride content of the blood and the acid base balance.

In seven of the cases the chloride content of the blood was found to be very low at the time of the patient's admission to the hospital, in two it was only slightly lower than normal, and in one it was normal. The differences were explained by the difference in the length of time that had elapsed since the occurrence of the poisoning.

Mercury poisoning is always accompanied by a decrease in the chloride content of the blood which becomes greater with time. This decrease is not the cause of the marked impairment of kidney function, as the function of the kidneys is impaired immediately by the poison itself whereas the decrease in the chloride content of the blood is not marked until about the third day. However, the decrease in the chloride content of the blood impairs the kidney function still further as is evident from the fact that following the administration of large doses of salt particularly in the form of hypertonic salt solution, diuresis improves and the improvement is especially rapid when the chloride content of the blood approaches normal again. The concentration of urea in the urine also increases and as a result the urea content of the blood decreases.

Sufficient amounts of salt cannot be administered by subcutaneous injection. For effective action it is necessary to give intravenous injections of large amounts (from 100 to 150 c.cm.) of a 20 per cent hypertonic salt solution for several days in succession. These large doses of salt are very well tolerated.

The edema which appeared in two of the author's cases did not interfere with the progress of diuresis and was absorbed without any ill effect.

Even after the patients had recovered apparently normal health the acid-base balance had not returned to normal, but indicated a gaseous acidosis, that is, an acidosis due to an excess of carbon dioxide. This must have been due either to a decrease in the stimisability of the respiratory center or a deviation of the iso-electrical point of the hemoglobin toward an alkaline pH.

AUDREY GOSS MOROHN M.D.

Patch F. S. and Reid R. G.: Carbuncle of the Kidney with a Report of Two Cases of Bilateral Involvement. *Brit. J. Urol.*, 1933, v 34

Renal carbuncle is a typical disease of the kidney developing secondarily to a suppurative focus elsewhere in the body. As a rule the infecting organism is a staphylococcus brought to the kidney by the blood stream from a furuncle carbuncle or other peripheral focus. The symptoms usually develop gradually. There may be a high fever which is continuous, remittent, or intermittent. Urinary symptoms may be absent and the urine may contain only a small amount of pus or no pus. At times, fever, lassitude and headache may be the only symptoms. As a rule there are dull pains in the affected side. Frequently there is tenderness in the loin with occasionally muscular resistance. The kidney may be palpated and found swollen and tender. Perinephritic abscess often complicates the intrarenal condition. A leucocytosis is usually present. In many cases the differential diagnosis between carbuncle of the kidney, suppurative nephritis, renal abscess and the early stages of pyelonephritis is difficult.

The bilateral involvement is exceedingly rare. In addition to two cases of bilateral involvement the authors report two cases of unilateral pyelonephritic abscess in which a diagnosis of renal carbuncle was probably warranted and recovery followed drainage.

Case 1: The patient was a man thirty four years of age who complained of perineal pain and increased frequency of micturition. Eleven days previously he had had some abscessed teeth extracted. The extraction was followed by severe headache, dizziness and fever, an aching pain in the perineum and increased frequency of micturition. Venereal disease was denied. Examination revealed unilateral swelling of the prostate, a purulent urethral discharge and pyuria. The prostatic swelling seemed to be draining through the urethra. Cultures of the pus yielded the staphylococcus aureus. Following the patient's discharge from the hospital the symptoms quickly returned in an aggravated form. The prostate was then twice drained perineally. Two months later a ballotable renal mass, the size of an orange, appeared on the right side and the left kidney was slightly enlarged. Pain and tenderness were absent on both sides. Blood cultures yielded the staphylococcus aureus. The urine from the right kidney was very purulent and contained the bacillus coli and staphylococcus aureus. The urine from the left kidney contained a few pus cells. Drainage with an indwelling catheter and pelvic lavage were tried. The right kidney was drained with a tube. Cultures of the drained fluid yielded the staphylococcus aureus. A very obvious mass then developed in the region of

the left kidney region. Cultures of the fluid drained from this kidney also showed the staphylococcus aureus. The patient's general condition failed and an abscess developed in the left knee. This abscess also was drained. Death resulted from asthenia. The condition was a staphylococcus aureus pyemia. The autopsy findings were prostatic abscess, pyemia, bilateral carbuncle of the kidney, bilateral perinephritic abscess, carbuncle of the right lobe of the liver, acute cystitis, bilateral bronchopneumonia, acute bilateral purulent bronchitis, multiple pulmonary abscesses, bilateral basal empyema, ascites, and hydropericardium.

Case 2. The patient was a man forty-four years of age who complained of abdominal pain radiating to the right shoulder and weakness. He had been treated for catarrhal jaundice. Two months previous to his admission to the hospital he infected his shoulder by a scratch. Three weeks later pain began in the right upper quadrant of the abdomen, and after another three weeks this was followed by a cough with the expectoration of blood-streaked sputum. During the month preceding his admission to the hospital the patient had two mild rigors. A diagnosis of bilateral bronchopneumonia was made. Examination disclosed tenderness in the right upper quadrant of the abdomen and a discharging wound and abscess on the left shoulder. Cultures of the discharge yielded the staphylococcus aureus. The urine contained bile and pus cells. The patient had a fever and blood cultures yielded the staphylococcus aureus. Later the staphylococcus aureus was discovered also in the sputum. Pus was found in the urine only twice in five examinations (from 10 to 15 pus cells per high power field). Increasing jaundice and abdominal distention developed. Death resulted from staphylococcus aureus pyemia. The anatomical diagnosis was healing superficial infection of the right shoulder, pyemia, bilateral carbuncle of the kidney and perinephritic abscess, acute suppurative periarthritis on the right side, acute axillary abscess, acute peritonitis, acute bilateral empyema, pulmonary abscesses, acute bilateral bronchopneumonia, and acute purulent bronchitis.

Case 3. The patient was a boy seventeen years of age who was admitted to the hospital with the diagnosis of acute appendicitis. Examination revealed tenderness and resistance in the right lower quadrant of the abdomen and the right loin. The urine was normal except for a faint trace of albumin. There were healing boils on the neck. On removal, the appendix was found normal. Soon after the operation pain and tenderness developed in the right loin, especially in the costomuscular angle. Repeated urinalysis showed only a faint trace of albumin and an occasional leucocyte. Increased frequency of urination then began and a tentative diagnosis of renal carbuncle and perinephritic abscess was made. Pyelography revealed incomplete filling of the right lower calyx and slight upward displacement of the middle calyx. Cultures of the ureteral specimens were negative. Operation revealed an abscess

situated posteriorly about the upper pole of the kidney. Drainage was instituted. Cultures of the pus yielded the staphylococcus aureus. After the establishment of drainage the patient's condition improved, the urine became normal, and pyelograms showed at first decreasing signs of abnormality and ultimately normalcy.

Case 4. The patient was a woman fifty-three years of age who complained of loss of weight and strength, thirst, and the sensation of a mass in the right groin. Four months before her admission to the hospital she had had a carbuncle on her left temple. Examination at the time of her admission revealed tenderness in the epigastrium, the right upper quadrant of the abdomen and the right costomuscular angle, and resistance on the right side of the abdomen. Urinalysis showed a faint trace of albumin, but no pus. Operation disclosed a large, hard, lobulated mass in the region of the right kidney which was adherent to the undersurface of the liver and to the appendix. The kidney felt hard and fibrosed. A rise in the temperature was ascribed to a suppurative vein phlebitis on the right side. The urine was negative for a time, but later showed from 30 to 40 pus cells per field. On cystoscopic examination the urine from the right ureter was found pale and cloudy. That from the left ureter was normal. On pyelographic examination the left kidney was found normal, but the right kidney showed partly filled lower calyces apparently displaced upward, a finding strongly suggestive of tumor. Incision into the kidney released a little pus. The kidney cavity was drained. Stasis drainage continued for a time but complete recovery followed.

Although no pyelograms were made in the two fatal cases, the authors are convinced that pyelography would have revealed typical evidences of tumor. They state that the recent literature indicates a tendency toward more conservative treatment. While nephrectomy is usually followed by recovery, the possibility of involvement of the other kidney must be kept in mind. Resection, enucleation, incision, curettage and drainage, and drainage of the abscess alone have been employed, but occasionally a later secondary nephrectomy has been necessary. Conservative therapy is possible only when an early diagnosis is made. LOUIS NEWBLE, M.D.

Carli, G.: Hernia of the Ureter (L'ernia dell'uretere) (*Ann. Med. Chir.*, 1923, 21, 3078).

Hernia of the ureter occurs in association with intestinal or omental hernia and presents itself in either the inguinal or the femoral canal.

Carli cites cases reported in the literature and reviews eighteen cases treated at the Surgical Clinic of Siena. Of the latter seven were femoral and eleven were inguinal. Nine of the inguinal hernia were on the right side and two on the left. Of the femoral hernia, five were on the right side and two on the left. Of the inguinal hernia, nine were direct and two were indirect. Ten of the eighteen hernia occurred in males. One occurred between

the twentieth and thirtieth years of age four between the thirtieth and fortieth years, six between the fortieth and fiftieth years five between the fiftieth and sixtieth years, and two between the sixtieth and seventieth years. In nine cases the ureter alone was associated with the intestinal hernia, whereas in the others both the ureter and the bladder were present in the hernial sac. In no case was the ureter herniated without the intestine.

Of the ureterovesical herniae three were para peritoneal and six were extraperitoneal.

Hernia of the ureter is rarely diagnosed before operation. Of the cases reviewed, a correct pre-operative diagnosis was made in only one, a case in which the symptoms suggested urinary tract involvement.

The author finds ureterography of more aid in the diagnosis than catheterisation.

He states that in the cases reviewed there was no damage to the ureter after the operation but he mentions no postoperative study to ascertain such damage.

GEORGE C. PROSSER, M.D.

Beer B.: The Value of Ureteral Re-Implantation in the Bladder. *Am J Surg* 1933 22 8.

In 1902 Bissell collected fifty two cases in which an attempt was made to re-implant the ureter into the bladder. The first case was reported by Nuasbaum in 1876. With the development of urinary tract surgery and especially of surgery of carcinoma of the bladder the operation has assumed great importance. Reflux has played a very minor role. Careful cystoscopic study, the use of indigo-carmin and intravenous urography have demonstrated that in the majority of cases the operation has been of definite value.

The author divides his series of forty-one cases into the following four groups: (1) resection of the bladder and ureteral implantation for carcinoma thirty cases; (2) pelvic ureter damaged in a pelvic operation, four cases; (3) peridiverticulitis with injury of the pelvic ureter four cases; and (4) stricture of the lower part of the ureter three cases.

The cases of Group 1 are divided into four subgroups. In Subgroup 1 were eight cases in which intravenous urography was done from a few months to several years after the operation. One of the patients died but all of the others had good function two months after the operation. In Subgroup 2 there were five cases which were checked by later operation or autopsy. One of these cases was included also in Subgroup 1. In the four others the re-implanted ureters and the kidneys were found in good condition. In Subgroup 3 there were four deaths due to shock following the operation. In Subgroup 4 there were fourteen cases which were followed for years. Eight of the patients had no kidney symptoms, but four had definite renal infection. In the cases of two the follow up was inadequate.

Of the four cases in Group 2 the re-implantation was done by the author in three and in these cases

was followed by good results. In one case it was done twenty years ago by the intraperitoneal route at the time of the gynecological operation. In this case the kidney was destroyed.

In the cases of Groups 3 and 4 results were good. In describing the technique of the implantation the author states that the end of the ureter is cut for a 1 to 1.5 cm. in its long axis and is drawn through a large incision made through a convenient extraperitoneal part of the bladder. Thin chromic gut sutures are used. A rubber dam is used for drainage on the mesial side of the anastomosis.

CLAUDE D. PICKRELL, M.D.

BLADDER, URETHRA, AND PENIS

Haines, C.: Traumatic Rupture of the Urethra. *J Urol* 1933 29, 185

Haines urges conservative treatment of traumatic rupture of the urethra especially by less experienced surgeons. He states that end-to-end anastomosis is not always necessary as the defect often becomes repaired spontaneously. Pezzar catheters used as suprapubic drains do not drain the bladder adequately. Therefore Haines uses rectal tubes of sizes 30 to 34 F to drain the bladder suprapubically. He cites three cases of ruptured urethra—each of a different type—to illustrate the use of conservative measures.

THEODORE P. GRAUER, M.D.

Ainsworth Davis, J. C.: The Prevention and Treatment of Urethral Stricture of Inflammatory Origin. *Bull J Urol* 1933 11

Unfortunately there exists the impression that cure of gonorrhea is complete when the urethral discharge ceases and the urine is clear or contains only a few shreds. This is erroneous as these two signs should be regarded merely as stages in the progress towards cure in the treatment of strictures of large caliber. Massage of the prostate and seminal vesicles carried out every third day and followed by complete irrigation of the urethra and bladder is the next step and it will often be found that the urine becomes cloudy again because of infection in these organs. The treatment must be continued until the urine is free from pus and organisms after massage. Next the urethra should be dilated under local anesthesia to empty the urethral glands which may have been infected. Dilatation should be followed by complete irrigation at weekly intervals until a caliber of over 40 F is attained and the urine is again free from pus and organisms after prostatic massage. If a non-specific urethral discharge persists the urethral glands must be emptied by suction, as with the apparatus of Kidd which consists of a hollow tube perforated by a large number of small openings. Three or four treatments at intervals of three days are usually enough to obtain perfect results. Each treatment should be followed by complete irrigation of the urethra. By the term organisms the author means not only the gonococcus but also the secondary invaders which maintain chronic glandular

infection with consequent periglandular fibrosis, the precursor of stricture.

Successful treatment depends upon dilatation of every portion of the urethra to a degree greater than its normal limits. When this is done systematically and the degree of dilatation is graduated, the ruptured fibers of the fibrous tissue are absorbed during the intervals between treatments and the lumen of the urethra gradually returns to its original caliber. The best instrument is Kollmann's antero-posterior dilator. In cases of stricture under 30 F the surgeon should be satisfied with an increase of 2 degrees at each sitting. In cases of stricture between 30 and 40 F with an increase of 1 degree and in cases of stricture over 40 F with an increase of $\frac{1}{2}$ degree. The treatments should be carried out at weekly intervals and followed by complete irrigation of the bladder with a 1:3,000 solution of acriflavine or a 1:6,000 solution of oxymercurochrome of mercury according to whether the urine is cloudy or clear. As a rule treatment is satisfactory up to about 35 degrees and after 38 degrees, but bleeding occurs quite often. This stage is the most critical from the standpoint of ultimate cure. When it is successfully overcome a good result is assured. When full dilatation has been reached on three consecutive occasions without any appreciable resistance before 40 F and without bleeding the intervals between treatments should be extended until finally only one treatment yearly is given as a precaution and the stricture may be regarded as cured. The dilatation is done by the author under local anesthesia.

Strictures of small caliber i.e. under 30 F which develop as a result of inadequate treatment of their causal disease usually do not produce symptoms until their caliber becomes less than that of the meatus, when diminution of the size of the urinary stream and some prolongation of the act of urination supervene. Too often these early symptoms are ignored and adequate examination is delayed until the development of infection with resulting frequency and discomfort or pain on urination. Occasionally treatment is delayed even longer until, perhaps after exposure to cold and damp or after alcoholic or sexual excess, almost complete retention develops. In such strictures, preliminary measures must be carried out until the urethra attains a caliber of over 30 F and treatment then given with the Kollmann dilator until a cure is obtained.

The methods of treatment may be classified as follows:

- 1 Instrumental (a) guides and followers (b) diathermy by guides and olives (c) continuous dilatation by catheters and (d) intermittent dilatation by bougies, gum-elastic, or curved metal.
- 2 Operative (a) internal urethrotomy (b) external urethrotomy (c) suprapubic cystotomy alone and (d) suprapubic cystotomy followed by excision or retrograde catheterization of the stricture.

In the use of guides and followers a sterilized guide with about $\frac{1}{4}$ in. of its tip bent to an angle of 30 degrees is gently passed down the urethra being

rotated from side to side to keep its point from catching in any lacuna, and the point is made to engage the opening in the stricture. This may take half an hour or more. The attempt is made to alter the position of the point of the guide slightly between each movement of insertion and withdrawal. If this procedure fails one of the following four methods is tried:

- 1 The guide is withdrawn, the angle of the terminal $\frac{1}{4}$ in. is altered, and the process repeated.

- 2 The guide is passed two or three other guides are passed alongside it and each guide is manipulated in turn until one is made to engage in the canal of the stricture.

- 3 The urethra distal to the stricture is distended fully with olive oil which is retained by a penile clamp and one or more guides are passed and manipulated as before.

- 4 A Swift Joly urethroscope with a Wyndham-Powell tube is inserted into the urethra and the guide is passed by direct vision. This procedure should be delayed for a few days if bleeding occurs and is stopped at the first sign of bleeding.

- 5 A small follower is screwed into the guide and the joint tested by a firm pull so that the guide may not be left in the bladder when the follower is withdrawn. When pushed into the bladder the guide curls up and offers no resistance to the oncoming follower which is left in place for from three to five minutes to dilate the stricture further. On withdrawal, three larger followers are passed at one sitting.

The treatments are given weekly and continued until the whole urethra has reached a caliber of about 30 degrees English, after which bougies are used.

In the use of diathermy with guides and olives, the treatment is begun with an olive which can just be passed into the bladder. This is then withdrawn and an olive of the next size attached. When the stricture is reached the current is turned on until a sensation of heat is felt by the patient. Still larger olives are then used.

Continuous dilatation by catheters is employed for very dense strictures which do not respond to intermittent methods and for resilient strictures prior to such processes as litholapaxy. After twenty-four hours the catheter becomes quite loose and the use of a larger size is possible. In this way even a very resistant stricture can be dilated from 6 to 27 F within a week or so. It is then dilated by a Kollmann dilator.

Dilatation by gum-elastic bougies is the most common form of intermittent treatment and an effective link between the use of guides and followers and Kollmann's dilator. If obstruction is encountered, smaller sizes are tried until one is found to enter the canal of the stricture. The bougie is then withdrawn and the bladder irrigated with oxymercurochrome of mercury solution. Urinary antiseptics, such as hexamine before meals and an acid mixture after meals, are administered for three days before instrumentation and alkalies for a similar period.

after instrumentation. At subsequent treatments given at weekly intervals no more than three bougies are passed and the second is the largest used at the previous treatment. The treatment is stopped at the first sign of bleeding. After size 30 F is reached Kollmann's dilator is employed.

Curved metal sounds are used for posterior urethral obstruction due to prostatic abscess, anterior urethral obstruction due to penurethral abscess, and in treatment preliminary to such procedures as litholapaxy.

The indications for operation include (1) in ability to pass a guide in cases of retention (2) in ability to pass a guide on three consecutive occasions, (3) strictures intolerant of dilatation after the skilled passage of instruments as evidenced by rigors, hemorrhage, retention or epididymitis on each occasion (4) the presence of penurethral extravasation (5) certain cases of penurethral abscess (6) stricture complicated by acute cystitis enlargement of the prostate or in some cases, vesical stone (7) renal failure (8) as a preliminary to excision of the stricture and (9) certain complications occurring during treatment e.g. the breaking off of a guide in the bladder.

The operations are internal urethrotomy, external urethrotomy and suprapubic cystotomy. Suprapubic cystotomy is sometimes followed by excision of the stricture but most commonly by instrumental dilatation by one of the methods described or retrograde catheterization. Operation should only be done as a last resort. LOUIS NEUWELT, M.D.

GENITAL ORGANS

Lower W. E.: The Endocrine Influence on the Male Sex Organs. *New England J Med* 1933 cviii 878.

The main theme of this article is the influence of certain hormones upon the prostate gland. Lower and his co-workers are conducting animal experiments to determine the relationship between the gonads and the pituitary gland. A study of the voluminous literature on the subject and their own experience leads them to the following conclusions:

1. The testicle produces two hormones (a) a hormone from the interstitial cells which regulates the male generative organs and (b) a hormone from the germinal epithelium which inhibits hyperfunction of the pituitary gland.

It has been proved by Martins that the pituitary gland of a castrated animal is hyperfunctioning. This observation leads to the conclusion that the testes exert an inhibiting influence on the rate of pituitary activity and that prostatic hypertrophy is a physiological reaction to a functional disturbance of the endocrine system. In eunuchs no male sex hormone can be demonstrated and the prostate is small and atrophic. About forty years ago castration was performed for prostatic enlargement, but later it was abandoned because of its high mortality.

Lower believes that the germinal epithelium of the testes secretes a substance which inhibits over activity of the pituitary gland, and he is applying this theory clinically. In males senescence causes degenerative changes in the germinal epithelium and as a result the pituitary gland increases in size and is hyperactive. The hyperactivity of the pituitary gland stimulates the interstitial cells of the testicle to produce an excess of the male sex hormone which causes prostatic hypertrophy. The hypertrophy of the prostate may be prevented by inhibiting the influence of the anterior lobe of the pituitary gland and of the gonads. The influence of the gonads is inhibited by the production of testicular ischemia or by artificial castration by ligation of the main blood supply of the testicle. Testicular ischemia weakens the interstitial cells and prevents an excess of the male sex hormone. In a few cases reduction of the gland has been followed by cessation of obstructive symptoms. The procedure recommended by Lower is transurethral resection of the obstructive portion and ligation of the blood supply of the testicle. This is recommended for the large soft glands, not for the fibrous prostate. It is less hazardous than prostatectomy and from an economic point of view is decidedly preferable. Ligation of the blood supply of the testicle is effected by dividing the internal spermatic and deferential arteries with the vas. No sloughing has been observed. Lower is now carrying out experiments to determine whether the same results can be produced by injecting substances directly into the testicles.

MAURICE MARTIN, M.D.

Morrison C. Webb-Johnson A. E., Lee, R. O. Nitch C. A. R. and Others. Discussion on Tuberculosis of the Male Genital Tract. *Proc Roy Soc Med Lond* 1933 xvi, 793.

MORRISON says that the portal of entry of tuberculosis can never be any part of the genito-urinary tract. The infection may reach the genital tract from the urinary tract by direct extension or may be a blood-borne complication from a focus somewhere outside of this system. In Morrison's opinion the organ first involved is the testicle, but some believe it is most often the prostate. The spread of the infection from the external genitalia to the accessory sex organs occurs by way of the lymphatics within the wall of the vas or within the lumen of the duct. Morrison believes that the normal kidney cannot filter the organisms of tuberculosis from the blood stream into the urine. When the genital organs become infected from the urinary passages urethritis occurs first and is followed by invasion of the prostate and seminal vesicles and finally invasion of the testicles. When only one kidney is involved, unilateral genital tuberculosis on the same side is the rule. Morrison believes it is impossible for the spermatozoa to carry the tubercle bacillus. He states that avian tuberculosis may be transmitted to man from fowls in the same way as psittacosis. The younger the subject the more virulent the infection.

For cases of suspected tuberculosis of the genital tract, Morson advises the usual roentgen examination of the lungs, examination of the sputum, and sedimentation and guinea pig inoculation of the urine. When the urine is negative the infection may be blood-borne. The scrotum should be examined for changes in the rugae, loss of elasticity of the skin, wasting of the cellular tissues immediately beneath the dermis, adhesions of the skin to the epididymis, and lack of mobility of the testicle.

Morson has found tuberculin of little value for either general or localized lesions of tuberculosis. He advises general supportive treatment, exposure to ultraviolet rays, a diet rich in vitamins, and supportive drugs. He regards halibut oil as more effective than cod liver oil. For cases without suppurative abscesses or involvement of the skin of the scrotum he advises medical treatment with prolonged sanatorium treatment. He recommends division of both testes.

WERN JOHNSON says that in contrast to the surgical management of malignant disease the complete extirpation of the lesions of tuberculosis is seldom feasible necessary or desirable as there is an inherent natural resistance to infection. He emphasizes the importance of cooperation of the patient with his doctor and of prolonged sanatorium treatment in tuberculosis.

LEE says the more radical operative procedures are no more effective than the more conservative procedures in the treatment of genital tuberculosis.

FARRIMAN states that he favors conservative treatment of genital tuberculosis, especially the use of tuberculin.

FAYNE says that very little is known about the pathological characteristics and spread of tuberculous of the genital tract and that the results of

radical operation, conservative operation, and medical treatment are about the same.

NIRCH states that he prefers a so-called radical operation epididymo- (or orchido-) vasovascular tomy.

CLAUDE D. HOLMES, M.D.

CRABTREE, E. G., and BRODNEY, M. L.: An Estimate of the Value of Urethrogram and Cystogram in the Diagnosis of Prostatic Obstruction. *J Urol* 1933, xxix, 235.

The authors report a study of cystograms and urethrograms made in the cases of patients with different types of prostatic obstruction. They found these X-ray studies to be important diagnostic measures especially when intra-urethral treatment alone was to be employed. They are of value also to show the cause of poor functional results after operation.

The authors prefer a mental injection of Lipiodol by means of a 30-cm. syringe fitted with a mental tip. During the exposure of the film the sphincters are forced. Urethrograms can be taken in the anteroposterior, lateral, or semilateral position. Cystograms can be taken in the same positions after the bladder has been filled with a 3 per cent or stronger solution of sodium iodide.

Cystograms show three major variations from the normal: (1) filling defects of the bladder base, (2) elevation of the bladder base above the symphysis, and (3) asymmetry of the bladder base. When the prostatic gland is large, urethrograms show increased length of the prostatic urethra from the caput to the internal orifice, narrowing or flattening of the prostatic lumen, and deviation of the lumen from the midline. To determine the significance of these changes cysto-urethrography is necessary.

THEODORE P. GRAVER, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bauer W. Hyperparathyroidism: A Distinct Disease Entity. *J Bone & Joint Surg.*, 1933 xv 135

The author states that in the six years which have elapsed since hyperparathyroidism or generalized osteitis fibrosa cystica (von Recklinghausen) was first recognized clinically, a large number of cases have been reported. He believes that if sufficient interest is aroused in the condition, more cases will be detected before permanent bone changes and complications have occurred. Of even more interest at the present time is the question whether or not other skeletal diseases are due to hyperparathyroidism.

All cases of hyperparathyroidism or generalized osteitis fibrosa cystica thus far reported have been due to a parathyroid adenoma. Arthritis and Paget's disease are never generalized skeletal diseases. This fact indicates that they are not of parathyroid origin. The changes in calcium and phosphorus metabolism are (1) an increase in the serum calcium (2) a decrease in the serum phosphorus, (3) an increase in the excretion of calcium and (4) an increase in the excretion of phosphorus. Among the symptoms and signs accompanying these disturbances of metabolism are weakness, muscle and joint pains, frequent fractures, skeletal shortening, bone tumors, kidney and ureteral stones, and general decalcification.

Until some simple test for hyperparathyroidism is devised, all suspected cases should be carefully studied. The serum calcium and phosphorus and, if possible, the serum phosphatase should be determined. Parathyroidectomy should not be performed until sufficient evidence is obtained that the diagnosis is correct.

Funsten stated that some of his cases of ankylosing polyarthritis were operated on by Ballin with gratifying results and argues that the increased serum calcium and the ankylosis are manifestations of hyperparathyroidism. However metastatic calcification is a very late manifestation of the disease which is found only in fatal cases or in animals which have succumbed to overdoses of parathormone.

All cases of hyperparathyroidism observed by Bauer have shown a permanently elevated serum calcium and not transitory elevations such as those reported by Funsten. In neither form of arthritis has Bauer seen any signs suggesting hyperparathyroidism as a causal factor. He believes that the improvement reported after parathyroidectomy may have been due to anesthesia, rest in bed, or a natural remission.

Bauer reports a case of progressive parathyroidism in which the parathyroid tumor was found in the region of the mediastinum. Although the patient had suffered from the disease for thirteen years and bone deformities were present there was no evidence of arthritis.

The theory of Ballin and Morse that Paget's disease is due to hyperparathyroidism is rejected by Bauer because the signs and symptoms of the two conditions are not the same. In Paget's disease fractures are infrequent, the changes are sometimes confined to one long bone, and the entire skeletal system is never involved. Moreover the cortex of the bones is thick whereas in hyperparathyroidism it is thin. However histological sections may be similar. In Paget's disease the increase in the serum phosphatase is much more marked than in hyperparathyroidism.

In Bauer's opinion the patients of Ballin and Morse who have shown improvement following parathyroidectomy have not been followed for a sufficiently long period of time to warrant a definite conclusion that lasting benefit or cure has been obtained. Bauer believes that neither arthritis nor Paget's disease is due to hyperparathyroidism.

ROBERT V. FUNSTEN, M.D.

Tammann H.: Experimental Osteochondritis Dissecans (Ueber experimentelle Osteochondritis dissecans). *Arch. f. klin. Chir.*, 1930 clxxii, 450

The author reports the results of experiments on dogs in which the attempt was made to produce osteochondritis dissecans artificially. On the basis of the theory that the site of the injury causing this disease is to be sought in the subchondral osseous tissue, the knee joints were opened from the lateral side, canals were drilled in the lower epiphysis of the femur and, in their ends, by means of the coagulating electrode electrical coagulation of the subchondral bone was done until the articular cartilage over the treated area in the region of the medial condyle or the intercondylar fossa showed a fine gray discoloration. The animals sustained no injury from the operation itself. They were able to move about and to bear weight on the extremity operated on. The roentgenograms showed nothing abnormal, probably because the changes were too slight. Only in bone specimens was it possible to demonstrate translucent areas in the subchondral bone structure by roentgen examination. The findings after various periods of time were as follows:

At the end of a week the area of coagulation showed fragmentation of the spongiosa with hemorrhages, signs of a reaction in the neighboring trabeculae and distinct injury of the contiguous articular cartilage, the cells of which extending in vertical

rows to the surface were considerably paler than those of the surrounding tissues.

After twenty two days, macroscopic examination revealed in the intercondyloid fossa a flat oval depression with gray but shiny articular cartilage. On microscopic examination the articular cartilage in this area was found to be severely damaged, the cartilage cells being visible merely as cell shadows. The demarcation from the normal cartilage was distinct but in the marginal zone numerous cartilaginous germinating capsules were to be seen. The echar in the subchondral bone was much less extensive and situated at about the center of the cartilage injury. The granulation tissue surrounding the destroyed spongiosa penetrated into the damaged articular cartilage. This represented the beginning of the dissection the liberation of the injured portion of cartilage from the epiphysis, which reached its maximum in the experiments which were continued for sixty days.

After sixty days macroscopic examination disclosed a defect in the cartilage the base of which was filled with bright red granulation tissue. Still attached to the edge of the defect there was a piece of cartilage the size of the head of a pin, and in the upper joint recess there was a free joint body with a diameter of about 2 mm. Microscopic examination showed the coagulation area replaced by newly formed osseous spongiosa which was covered by a cellular pannus and formed the immediate borders of the joint cavity. At the edge of the cartilage defect there was a less extensive injury of the cartilage which was similarly marked off from the preserved cartilage by the proliferation of cartilage germinating capsules. However the piece of cartilage in the edge of the defect showed well preserved cartilage cells, as did also the free joint body. The latter has a thin fibrous capsule.

Accordingly it is evident from these experiments that the severely injured articular cartilage may be reformed even after its expulsion, and that in this way free joint bodies may be formed. The only difference from the free joint bodies formed in osteochondritis dissecans was the absence of spongiosa bone. The author believes that even this difference might have disappeared if the experiments had been continued longer. **MAX BUDER (Z)**

Scott, E., Stanton F M., and Oliver, M: Multiple Myeloma: A Report of Five Cases. *Am J Cancer* 933 xvii, 68

To the 425 cases of myeloma collected by Geschickter and Copeland in 1928, the authors add 30 others from the literature and 5 of their own. The clinical features are reviewed. Pain is often the first symptom. Forty per cent of the cases show symptoms of cord compression. Multiplicity is the rule only 2 cases of single lesions have been reported. Fractures are common. Bence-Jones bodies may appear in the urine intermittently.

The microscopic findings and the theories regarding the histogenesis of the condition are discussed.

From a study of the maturation stages in fast growing myelomata and their similarity to experimentally produced plasma cells, the authors conclude that the tumor plasma cell is a derivative of the reticular cells of the hematopoietic and general connective tissues and closely related to the lymphocytic series.

The authors 5 cases of multiple myeloma are reported in detail with photomicrographs.

WALTER P. BLOOM, M.D.

MacCallum, P: Rhabdomyoma of the Extremities. *Australian & New Zealand J Surg* 1933, II, 196.

Tumors in which muscle fiber is the chief tissue may arise in or near normal striated muscle or in places remote from muscle. When they have occurred in places remote from muscle they have been considered developmental anomalies, embryonal disturbances, or aberrant teratomata. They may occur at any age in either sex. Occasionally there is a history of trauma.

As a rule such tumors are rounded single or multiple nodules but when they occur in muscle sheaths they may be flattened. They are soft in consistency and on section appear grayish with yellow or red areas. On microscopic examination the muscle fibers show no orderly parallel arrangement as in normal muscle. The cells resemble the embryonal type most of them are spindle shaped. They are striated both ways, but the longitudinal striations are usually the more prominent. Many giant cell forms occur.

The tumors may grow slowly. After surgical removal they may recur locally or at a distance. Metastases have been known to occur in the lungs. Neighboring lymph glands may be involved.

The author reports two cases. The first was that of a man fifty-nine years of age who had a small tumor of a few weeks duration removed from his arm. Six weeks later a much larger and more diffuse growth, extending from the elbow to the shoulder was removed. About a month later the arm was amputated at the shoulder. A few weeks after the amputation death occurred from pulmonary embolism. Autopsy was not performed. The mass of the tumor in the amputated arm was muscle. There was no bone involvement. Microscopic examination showed spindle cells with cross striations, necrotic material, and giant cells.

The author's second case was that of a woman seventy years of age who sought treatment for a swelling of the right leg which had been gradually increasing for a year. After surgical removal, the swelling which was in the gastrocnemius muscle, was found to be a dense tumor about the size of a tennis ball. Eighteen months after the operation it recurred in much larger size at the same site. It was semi-fluctuant and adherent to the skin but not to the bone. No further surgery was done. The tumor ulcerated through the skin and the patient died about four months later. Autopsy disclosed a well-form, homogeneous, grayish white tumor involving

the calf muscles. There were no metastases. The tumor showed the spindle shaped, cross-striated cells characteristic of rhabdomyoma.

MacCallum believes that these muscle tumors are not so rare as is generally supposed. In both of his cases the original diagnosis was active fibroma and the correct diagnosis was made only after careful histological examination. Many such tumors may have been classified as sarcomata. Their similarity in structure to certain bone sarcomata may be extremely close, and an origin from bone is apt to be assumed.

WILLIAM ARTHUR CLARK, M.D.

Coley W. B. The Treatment of Sarcoma of the Long Bones. *Ann Surg.*, 1933 xxvii, 434

This article is based on 500 bone tumors 360 of which were malignant operable sarcomata.

Coley believes that the ideal classification of bone sarcoma has not yet been reached, but that the classification of the Bone Sarcoma Registry is the best available. He emphasizes that for practical purposes the classification must be simple. It should indicate whether the sarcoma is periosteal or central whether it is an osteogenic sarcoma or an endothelial myeloma and, if a central sarcoma, whether it is primarily benign or malignant.

In the majority of cases a correct diagnosis can be made on the basis of the clinical and roentgenological evidence, but in from 30 to 25 per cent a histological examination is necessary. Coley believes that the dangers and disadvantages of biopsy have been greatly over-emphasized, and that while it is often possible to make a positive diagnosis of osteogenic sarcoma from the roentgenogram alone in the later stages of the disease, in the early stages this is not true and biopsy is justifiable. He has given up trying to make definite diagnoses from frozen sections and believes that in borderline cases it is safe to wait for the paraffin sections before deciding on amputation.

In discussing irradiation he states that he has been convinced for many years that osteogenic sarcoma is highly resistant to irradiation as well as to Coley's toxins, and that the treatment of choice for this type of bone tumor is immediate amputation followed by a course of prophylactic treatment with toxin. He does not approve of preliminary irradiation, but states that when amputation is followed by prophylactic treatment with toxin the incidence of five year cure is twice that obtained by early amputation alone.

He states that in early operable cases of endothelial myeloma or Ewing's sarcoma involving a long bone it is very difficult to determine the best procedure but that a careful analysis of the end results of the different methods seems to warrant a trial of systemic treatment with Coley's toxin combined with local irradiation, preferably with the radium pack for a limited period of time before resort is had to amputation. If no definite improvement is noted at the end of from six to eight weeks, no further use of conservative measures is justified.

For multiple myelomata, which are radiosensitive tumors involving a number of bones, the best treatment appears to be the use of the Heublen unit combined with systematic treatment with Coley's toxin.

In the majority of cases of giant-cell tumors conservative measures should be tried first. Primary amputation should be done seldom if ever. However Coley states that the poor results of irradiation in the treatment of giant-cell tumors are almost never mentioned. His chief objection to the use of irradiation as the method of choice is the period of disability associated with it and the impossibility of making a correct diagnosis in about 20 per cent of the cases. He states that while it is possible to cure a giant-cell tumor of a long bone by irradiation irradiation has not been proved superior to all other methods. He believes that if the case is treated primarily by surgery combined with toxins and irradiation more information will be obtained and more benefit offered. In cases of giant-cell tumor a simple biopsy should never be performed but the aspiration biopsy method may sometimes be employed to advantage.

In a comparative study of the early and late statistics regarding osteogenic sarcoma a notable improvement in the results was found. Of 261 patients with malignant sarcoma of bone exclusive of giant-cell tumors who were treated prior to November, 1927 54 (20.7 per cent) have remained well for five years or longer. Coley is of the opinion that the present pessimistic attitude regarding the prognosis is without foundation in fact. He states that a favorable prognosis depends on early diagnosis and a proper course of treatment.

The article is concluded with the following statement: 'Bone sarcoma is a field in which a careful weighing of all evidence the clinical, the roentgenological, and the histological is required. In other words in order to arrive at a correct diagnosis, especially in the early stages of the disease a close cooperation on the part of the surgeon the roentgenologist, and the pathologist is most essential.'

PAUL C. COLONNA, M.D.

Cave, P. Osteoplastic Metastases. *Brit J Radiol* 1933 vi, 69.

Cave reports the case of a man sixty three years of age who died three years after the first symptoms of carcinoma of the prostate. Autopsy revealed pleural adhesions numerous shotty gray granules in the lungs suggesting malignant peribronchial infiltration, evidence of adenocarcinoma in the lung tissue and tumor invasion of the vertebrae. Roentgenograms showed marked density of the pelvic brim extending only to the sacro-iliac joints an osteoplastic metastasis of the sacral promontory mottling of the lateral halves of the ilia by osteoclastic metastases a pathological fracture in the left ilium increased density of the eighth, eleventh and twelfth thoracic vertebrae a few scattered osteoplastic metastases in the ribs, osteoclastic

metastases and two united pathological fractures in the right humerus, multiple osteoclastic metastases in the right radius and ulna and both femora and a pathological fracture in the right femur.

The presence of osteoclastic changes suggests arterial dissemination. In the case reported such dissemination was evidenced by the pulmonary metastases. Osteoplastic metastases indicate involvement by way of the lymphatic channels and have their origin most frequently in the prostate and breast. Malignancy of the thyroid produces metastases most often in the skull, lower jaw, sternum, vertebrae, and ribs. As a rule the metastases are of the osteoclastic type.

Osteoplastic metastases occur most frequently in the lower spine, the skull, and the sternum.

The end-result of bone sclerosis produced artificially and that caused by the activity of cancer cells is the same and it is not unreasonable to suppose that the essential causative mechanism in both is the cutting off of the local blood supply.

After the occurrence of a pathological fracture at the site of an osteoclastic metastasis it is not uncommon for the fragments to unite firmly with an abnormal amount of bone sclerosis.

The author cites a case in which sections of the lumbar vertebrae and iliac bones revealed what appeared to be typical diffuse osteoplastic metastases from prostatic carcinoma, whereas a section from a thoracic vertebra disclosed equally dense bone but no malignant cells. He cites also cases of apparently benign condensing osteitis in the lumbosacral region or in the pelvis in the neighborhood of the sacro-iliac joints. He states that if this benign condensing osteitis can be accepted as a clinical entity similar changes in bone in the lumbosacral region can be produced by the following three distinct pathological conditions:

1. A benign condition of unknown origin, probably due to vasoconstriction of nutrient vessels due to a sympathetic disorder (Bernard).

2. Lymph-borne metastases from carcinoma of the prostate and occasionally from carcinoma of the breast, caused by interference with the blood supply of bones by carcinomatous infiltration (Cave).

3. A change in the calcium content of otherwse normal bones in the vicinity of skeletal metastases, probably due to metaplasia of bone indirectly influenced by the neoplasm (Steward).

Osteoplastic changes from carcinoma of the prostate and carcinoma of the breast occur frequently in the lumbosacral region and the sacro-iliac joints and rarely in the axilla and thoracic vertebrae. As benign condensing osteitis occurs in the same localities, there is considerable evidence that some anatomical factor in the lumbosacral region favors the production of dense bone. Of significance also is the fact that condensing osteitis undoubtedly occurs in conjunction with, but at a distance from, carcinomatous metastatic bone deposits. It is suggested that the connecting link between these two phenomena is the anatomical interrelationship be-

tween the sympathetic ganglia and the lymphatic glands.

A study of the anatomy of the lymphatics and the sympathetic nervous system reveals that nowhere in the body are these two systems so abundant and so close to one another as in the lumbosacral and sacro-iliac regions. It is obvious that glandular enlargement in this region may exert pressure on the sympathetic chain, and it is likely that constant stimulation of the sympathetic might produce constriction of the nutrient arteries of the bones in the immediate neighborhood. In time vasoconstriction would probably lead to thrombosis with possibly permanent impairment of the nutrition of the bone.

In conclusion the author says there is good reason to believe that malignant invasion of glands occurs long before the osteoplastic changes in bone, and that Hodgkin's disease is the only other disease of long duration characterized by massive hard glands which would be likely to exert pressure on the sympathetic.

RUPPERS, S. RANCK, M.D.

Fursten, R. V.: Certain Arthritic Disturbances Associated with Parathyroidism. *J Bone & Joint Surg* 1935, xv, 213.

In the Orthopedic Clinic of the Harper Hospital, Detroit, a survey of ninety-five cases of arthritis, chiefly of the ankylosing type, was made in order to separate those showing evidence of hyperparathyroidism. Twenty-six showed such evidence in the form of prolonged pain, muscular weakness, stiffness of the joints, pathological fractures, and roentgenological evidence of demineralization of the bones and misappropriation of calcium. In all of the latter there was an abnormal elevation of the calcium in the blood and in most of them this was accompanied by a decrease in the blood phosphorus.

The chromadimeter and the electrocardiogram were used to determine the degree of muscular weakness.

Several of the cases are reported in detail.

In fourteen of the twenty-six cases parathyroidectomy was performed by Ballin. Only one of the surgically treated cases failed to show improvement. In nine cases there was marked improvement manifested by cessation of the pain and of the sense of stiffness in the joints within a few days after the operation. Improvement was regarded as marked only when the pain was entirely relieved and the roentgenograms showed increased density of the bone. In four of the cases there was moderate improvement.

Twelve cases were treated conservatively by the administration of cod liver oil concentrate and calcium gluconate, physical therapy, and the use of orthopedic appliances. Marked improvement resulted in five, moderate improvement in three and no improvement in four.

The author concludes that arthritis is very common in parathyroid disease, and that parathyroid disease is common in arthritis.

In mild cases in which it is impossible to make an absolute diagnosis and in the cases of patients who are poor surgical risks, conservative treatment may lead to improvement and at least temporary arrest of the disease.

In conclusion the author says that in none of the cases was the parathyroidectomy followed by tetany or shock, and that this operation may be considered a safe and justifiable procedure.

Ozerov A.I. Injuries of the Shoulder Joint Region (Verletzungen der Schultergelenkgegend) *Nov chiz Arch.*, 1933, xxvi 473

On the basis of his experience at the Traumatological Institute, Leningrad, the author discusses the most important of the injuries of the shoulder region paying particular attention to the treatment of joint traumas.

1. Dislocations of the shoulder. Anterior dislocations are much more common than posterior dislocations, the ratio of the former to the latter being 99:1. According to the mechanism of their action, the methods of treatment can be divided into the following five groups: (a) simple extension, (b) extension with pressure on the dislocated head of the humerus, (c) extension with lever action, (d) lever reduction and (e) rotation reduction. For subclavicular dislocations the best methods are those of Djanidze and Kocher. The treatment may be carried out under light ether or ethyl chloride anaesthesia, and the patient can generally be ambulatory. The reduction of bilateral dislocations at one time is inadvisable because of the danger of shock. Immobilizing dressings should not be used as any immobilization after the reduction of uncomplicated dislocations hinders healing and leads to the development of contractures. Active movements should be begun immediately after the reduction. Work should be resumed early.

2. Complicated dislocations. Statistics show that from 39 to 46 per cent of all dislocations of the shoulder are accompanied by distortions, ruptures or avulsions of tendons, separation of the greater tuberosity of the humerus, fractures of the head or neck of the humerus, the glenoid cavity or the apophysis of the neck of the scapula, tears of blood vessels and hemorrhages into articular cavities. In cases of hemarthrosis treatment by hot applications (Priessnitz compress, blue light, etc.) should be begun as early as the day following the trauma. Beginning on the third day light active movements and massage and beginning on the fifth day deep massage and more extensive movements should be carried out. The occurrence of pain will indicate the limits of mobility. The treatment of these complicated dislocations varies widely according to the type of injury present, from simple conservative physical therapy to important operations with exposure of the site of injury and such measures as bone suture, the removal of separated fragments of bone, excision of shrunken soft parts and division or transplantation of tendons.

3. Old dislocations. In case no bone injuries are found on roentgen examination an attempt at non-operative reduction is justified otherwise arthroscopy with division of the subscapular tendon and corresponding operations on the articular ends of the bones and articular soft parts is indicated.

4. Habitual dislocations. Mild cases in which the dislocation occurs seldom are to be treated conservatively by physical therapy such as massage, rhythmic faradization and medical gymnastics. More severe cases with frequent dislocations should be treated surgically. Methods of operative re-inforcement of the articular capsule and ligaments are very numerous. The following procedures may be considered: the formation of a distal capsular barrier, suspension of the head of the humerus by means of intra-articular or preferably extra-articular fascia and tendon transplantations, plastic procedures on muscle and the formation of bony barriers to protect against dislocation, even by means of free bone transplantation. The author has worked out his own method of musculoplasty and has used it in six cases with good results. The technique is as follows:

Longitudinal suture of the subscapularis muscle with inclusion of the articular capsule in the suture is done. The external border of the short head of the biceps is then fastened to the tendon of the subscapularis with the arm rotated externally to the maximal extent. If the extreme rotation is not maintained the border of the biceps sinks and forms an obstacle internal to the head in the form of a wall of muscle. An abduction splint is applied for from one and a half to two weeks and physical therapy is carried on for ten days.

From the operative results in twenty-five cases the author concludes that simple capsulorrhaphy should not be done. Fascioplasty was followed by recurrence in a third of the cases. Better results are obtained from the formation of a bony barrier. In men doing heavy work the author's own method of musculoplasty has given good healing without recurrence which has now lasted over an observation period of more than two years.

Fractures of the head, neck and both tubercles of the humerus, bursitis, periarthritis and ruptures and avulsions of muscles and tendons are discussed briefly.

The author concludes that the diagnosis of fresh dislocations of the shoulder can be made in complicated cases only with the aid of roentgen examination. Reduction must be effected without the use of force and in the cases of children and neurasthenics under general anaesthesia. Old dislocations must be treated surgically if there is marked limitation of function in the shoulder joint unless age or a pathological condition constitutes a contra-indication. The best approach to the joint for the operative reduction of anterior dislocations is obtained by incision along the anterior border of the deltoid muscle and for the reduction of posterior or complicated dislocations by an epaulette incision. For

exposure of the head of the humerus in subacromial dislocations resection of the coracoid process is absolutely necessary. The dislocated tendon of the long head of the biceps can also be reduced during the operative treatment of the dislocation, and if injured can be fastened to the intertubercular sulcus or the short head of the biceps. The displaced greater tuberosity of the humerus must be reduced by open operation. Total resection of the head of the humerus yields poor functional results. An economical resection should be done instead. To guard against postoperative hematoma formation a glass drainage tube should be inserted and left in place for two days. A Soisson-Jarosevic or a Volocko abduction splint is more comfortable and economical than a plaster-of-Paris splint. In habitual dislocations fascial suspension of the head of the humerus can be recommended only for persons who are not engaged in heavy physical work. For those who do heavy work lengthening of the coracoid process by free osteoplasty may be recommended if the coracoid process is too short, and lengthening with a flap of bone and periosteum from 3 to 4 cm. long formed from the process and turned back, if the coracoid process is of normal length. G. ABRON (2)

SURGERY OF BONES, JOINTS, MUSCLES, TENDONS, ETC.

Ghormley R. K., and Bray E. A. Resected Knee Joints. *Arch Surg* 953 XLVI, 465

The authors reviewed the records of 236 resections or fusion operations and 9 amputations performed for disease of the knee joint in the years from 1919 to 1931 inclusive, at the Mayo Clinic. In 245 cases in which operation was performed, the incidence of trauma or infection as an inciting or predisposing factor, the duration of symptoms and the age and sex of the patients were noted.

Tuberculous males outnumbered tuberculous females by the ratio of 2.5:1 whereas non-tuberculous males outnumbered non-tuberculous females by the ratio of 1.2:1. In 55.8 per cent of all cases the disease was present more than five years before the operation.

In the 256 cases in which tuberculosis was present and operation was not performed, the ratio of males to females was the same and the percentage of cases in which inciting trauma was apparent was 36.6.

In the early cases the authors found it difficult to pick out any constant features in the roentgenogram which could be said to identify either type of lesion. Marked differences were absent also in the advanced cases, but in the moderately advanced cases more typical changes were found. In all of the cases in which changes were apparent in the roentgenograms the disease was probably well advanced.

As an aid in diagnosis the intact joint space must be regarded with some reservation. Often there is flexion contracture in the knees and the joint space

cannot be truly represented in the roentgenogram. In most of the cases reviewed by the authors there was greater destruction of cartilage in the non-tuberculous joints for a given duration of symptoms.

Sections were cut through the surfaces of joints of the complete specimens of 91 tuberculous joints, 15 non-tuberculous joints, and 1 Charcot joint. In all cases, 3 types of changes were investigated namely bony synovial, and cartilaginous.

Of the authors group of 163 cases of proved tuberculosis, 5.6 per cent were correctly diagnosed clinically. In 13.6 per cent tuberculosis was considered a possibility and in 10.8 per cent the diagnosis of non-tuberculous arthritis was made. Of the 66 proved cases of non-tuberculous arthritis, 86.3 per cent were so diagnosed before operation, while 13.7 per cent were diagnosed as tuberculous.

The tuberculin test cannot be considered a dependable diagnostic measure, especially if the patient is an adult. A negative reaction is of more significance than a positive reaction.

The article is summarized as follows:

The clinical history, roentgenograms, lesions discovered on macroscopic and microscopic examination, and the results of inoculation of guinea pigs in a series of 236 cases of resection and 9 cases of amputations of the knee joint have been studied.

The pre-operative diagnosis was found to be incorrect in 24.4 per cent of the cases of tuberculous arthritis and in 13.7 per cent of the cases of non-tuberculous arthritis.

The gross specimens and roentgenograms were found to vary so widely as often to prevent an accurate diagnosis.

The inoculation of guinea pigs proved incorrect in 19.5 per cent of the 24 cases in which it was done.

The diagnosis made by microscopic examinations of tissues removed at the time of operation was found accurate in all but 3.2 per cent of the cases.

FRACTURES AND DISLOCATIONS

Florentini, A. Subacromial Dislocation of the Humerus (Sulla lussazione sottoacromiale dell'omero). *Chir* 93 III, 270.

Two cases of subacromial dislocation of the humerus are reported. Posterior dislocation of the humerus is much less common than anterior dislocation and is generally caused by more serious accidents. It constitutes only about 2.2 per cent of dislocations of the shoulder. This is explained in part by the fact that it is easier to fall on the external surface of the shoulder than on the anterior surface, and in part by the fact that the posterior part of the joint capsule is reinforced by the tendons of the infraspinatus and teres minor muscles and is partly protected by the vault of the acromion.

There are two types of posterior dislocation of the humerus—the subacromial, in which the head of the humerus is displaced backward and located beneath the acromion, and the subspinoous, in which it is displaced into the subspinoous fossa of the

scapula. The former is much more common than the latter. As a rule it is not caused by a direct blow on the shoulder from in front backward as such a blow would fracture the acromion or the posterior border of the glenoid fossa. It is more apt to be caused by a fall on the elbow or hand with the arm thrown forward and compelled to undergo a movement of forced internal rotation or by movement of the trunk in the opposite direction with the hand or elbow fixed against the ground.

Subacromial dislocation may be accompanied by lesions of the bones. The most common osseous lesion is detachment of the lesser tuberosity of the humerus which remains fixed to the tendon of the subscapularis muscle. In some cases the greater tuberosity may be detached and remain adherent to the tendons of the supraspinatus and infraspinatus muscles.

The arm lies close to the trunk in internal rotation. The axis of the humerus is directed upward outward, and backward. Looked at from in front, the shoulder is flatter than the normal shoulder and its transverse diameter is increased. Most

striking in the front view of the shoulder is abnormal prominence of the coracoid process and the anterior angle of the acromion. Between these two prominences there is a more or less marked longitudinal sulcus. Palpation reveals an empty space beneath the anterior angle of the acromion and the presence of the head of the humerus in the space below the posterior angle of the acromion. The posterior displacement of the head of the humerus is shown also by roentgen examination.

The dislocation can be reduced quite easily under ether anesthesia by direct pressure from behind forward on the head of the humerus associated with external rotation of the arm which has previously been abducted. The arm should then be fixed in slight abduction and external rotation. In cases of habitual dislocation, operation is necessary. In the author's opinion the best method is extra articular suspension with a free transplant of fasciata. The period of immobilization necessary depends on the patient's age and condition and the tendency of the dislocation to recur.

AUDREY GOSWAMI M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Mahorner H R.: Thrombo-Angiitis Obliterans.
Am J Surg 1933 xli, 4-9.

The author discusses the causes, clinical manifestations, pathological changes, diagnosis, and treatment of thrombo-angiitis obliterans. He traces the development of the accepted theory that the characteristic pathological changes are an inflammatory reaction extending through the wall of the vessel with associated thrombosis and later organization and canalization of the thrombus. He states that the artery, vein, and nerve may be bound together by extension of the chronic inflammatory reaction through the vessel wall. Even the vasa nervorum may show perivascular collections of lymphocytes. Attention is called to the important development by the unaffected vessels of a collateral circulation to carry the blood flow to the distal part past an obstruction in one of the main arteries.

The symptoms of thrombo-angiitis obliterans are due to ischemia plus the effects of migratory phlebitis. Intermittent claudication, coolness and rubor of the foot, excessive blanching on elevation of the extremity with a tardy return of the normal color to the foot, trophic changes, absence or decrease of the pulsations, and pain on rest are the important signs of the disease. It is generally pain which causes the patient to seek treatment. In typical cases recognition of the condition is not difficult if all of the symptoms are kept in mind but the consideration of individual symptoms alone and without recognition of their circulatory basis leads to such diagnoses as multiple neuritis and epidermophytosis.

There is no specific method of treatment. Conservative treatment should always be tried until the progress of the disease demands radical measures. Amputation should be delayed as long as possible although in individual cases economic considerations enter into the decision. The therapeutic measures most commonly used are described briefly. The author believes that the intravenous administration of fluids is illogical. In some cases, typhoid vaccine administered intravenously in courses has given encouraging results. However it has important disadvantages and does not prevent rapid progress of impairment of the circulation. Injection of the peripheral nerves with alcohol, as described by Smithwick and White, is a procedure of great value to relieve intense pain. Vasodilatation is accomplished most satisfactorily by lumbar ganglionectomy. The author emphasizes the importance of selecting cases for operation on the basis of the vasomotor index. As the essential

lesion is occlusion of the vessel rather than a functional spasm he warns against expecting too much benefit from operations on the sympathetic nervous system. Amputation is still necessary in cases of progressive gangrene. W J MINTON SCOTT M.D.

Gossel A., Bertrand, J. and Patel, J.: The Treatment of Arterial Embolism of the Extremities. A Critical Study (*Le traitement des embolies artérielles des membres. Étude critique*) *J de chir* 1933 xli.

The authors review the circumstances under which embolectomy and arteriotomy are being practiced and the results which have been obtained from these procedures. They draw the following conclusions:

1. All cases of peripheral arterial embolism are complications of a primary cardiovascular disease.

2. All emboli usually lodge in dangerous zones, at the level of major bifurcations of the arteries or at the origin of large collateral arteries.

3. All emboli cause changes in the wall of the artery at the site of lodgment and then enlarge by causing further thrombosis.

4. All emboli that become lodged in peripheral arteries bring about complications, the course of which is variable but usually serious.

The principal object of surgical treatment is to re-establish the circulation and thus prevent or limit gangrene. Thrombotripsis is considered illogical and generally ineffective and amputation should be done only after all conservative measures have failed.

The difficulty of localizing the site of lodgment of the embolus is emphasized. Motor and sensory disturbances furnish only uncertain localizing signs. The oscillogram shows only gross changes. The most accurate information is obtained by palpation of the peripheral pulses and arteriography.

On the basis of a comparative study of the value of embolectomy and arteriotomy the authors summarize the disadvantages of embolectomy as follows:

1. The technical difficulty of the operation.
2. The need for absolute asepsis.
3. The speed and accuracy with which the operation must be done.
4. The danger of damaging the intima of the artery during the operation.
5. The persistence of the diseased artery after the embolectomy which may give rise to secondary thrombosis.

Obstruction of an artery causes changes in the nervous plexuses in the adventitia of the artery, and the repeated irritation causes, in the periphery vasomotor disturbances, usually of the vasoconstrictor type which may further embarrass the collateral circulation (Leriche). In two animals the

authors were unable to note beneficial effects from periarterial sympathectomy or the chemical sympathectomy of Doppler.

The advantages of arteriectomy over embolectomy (arteriotomy) are summarized as follows:

1. The operation is easy to perform.
2. There is no need for special surgical precautions.

3. Compression of the artery is not necessary, one cause of intravascular clotting or focus for abnormal vasomotor stimulation being therefore eliminated.

Clinical and experimental evidence is cited to show that arteriectomy may give excellent results.

There is some disagreement as to when arteriectomy is indicated. Grégoire believes that the embolus produces important lesions in the endothelium of the artery and thus predisposes to the formation of a new clot. Therefore he is of the opinion that the entire obliterated segment of the artery with its adventitia should be removed at once. Moore believes it is important only to remove the embolus which acts as the center of intravascular clotting and that consequently resection of a short segment, which includes the part of the artery damaged by the embolus, is sufficient. Useful collateral arteries are not disturbed by the local arteriectomy.

In conclusion the authors state that embolectomy is indicated in cases in which the embolus has lodged at the bifurcation of the aorta, external iliac artery, or similar large arteries. Arteriectomy is indicated in (1) cases in which it is necessary to act quickly because of the patient's poor general condition (Leriche) (2) cases of embolectomy in which the endothelium of the artery appears greatly altered after the embolus has been removed (Leriche) (3) cases in which local changes make proper suturing of the artery questionable (Moore) and (4) cases of impending gangrene of the extremity in which embolectomy has failed to give relief.

MORRIS R. REID, M.D.

BLOOD TRANSFUSION

Grasso: Re-Infusion in Hemoperitoneum from Wounds of the Liver (*La reinfusione negli emoperitonei da ferita del fegato*) *Chir. ital.*, 1932, viii, 1306

The author reviews the history of re-infusion of the patient's own blood in the treatment of disease and reports his experiments on dogs in which blood from injuries of the liver was re-injected. His experiments showed that in simple wounds of the liver re-injection gives excellent results when it is done within six hours after the injury. Even when the bile ducts were also injured and there was a considerable admixture of bile with the blood the re-injection caused no harm. The acute anemia was overcome without causing any general disturbances or any pathological changes in the blood.

A number of cases in which re-injection gave good results are cited from the literature. In two

cases in which it was done more than six hours after the injury death resulted from heart failure. Blood should not be re-injected if marked hemolysis has taken place.

In conclusion Grasso says that as the results of direct transfusion from donors whose blood groups have been determined are so satisfactory re-infusion is indicated only in emergency cases in which there is no time or opportunity for direct transfusion.

AUDREY GORS MORGAN, M.D.

Stetson, R. E.: The Causes and Prevention of Post Transfusion Reactions. *Surg. Clin. North Am.* 1933, xiii, 319

Post transfusion reactions may be divided into two main classes: (1) hemolytic, and (2) proteolytic.

Stetson agrees with Kordenat and Smithies who say: "There seems to be no reason why, if proper apparatus and sufficient technical skill are at hand, anything but whole blood should be employed in transfusion. The plea of expedience and speed should be no excuse for the use of blood altered by the addition of various salt solutions. If transfusion is really needed to insure clinical benefit, blood in its most efficient biological form should be employed and the operation of transfusion should be carried out with the greatest care."

The hemolytic reactions are of the following three types:

1. Those due to coagulation from incompatibility (mistakes in grouping, the presence of active minor iso-agglutinins, incompatibility of the white cells).

2. Those seen after the transfusion of individuals suffering from certain pathological conditions in which there is a very active hemolytic agent at work. The latter may appear in pernicious anemia, purpura, hemolytic jaundice, leukemia, and sepsis. Reactions of this type can be neither foreseen nor avoided, but the possibility of their occurrence should be kept in mind so that prompt measures may be instituted to counteract them if they should occur.

3. The toxic effects of sodium citrate on blood or early coagulation changes following the use of the sodium citrate method.

The majority of reactions due to incompatibility are manifested quickly after the introduction of even small amounts of blood. Therefore if the operator is familiar with the danger signals he will be able to stop the transfusion and institute restorative measures in time to save the patient a life. Stetson knows of a death resulting from the introduction of as small an amount as 40 c.c.m. of blood. The first symptom of a reaction due to incompatibility is usually severe pain in the lumbar region of the back. This is quickly followed first by flushing and then by pelling of the skin, profuse perspiration, dyspnea, cyanosis, falling pulse and dilatation of the pupils. Very often the patient believes he is dying. These acute symptoms are usually followed in a few hours by the appearance of blood, albumin and casts in the urine and sometimes by anuria. A blood

examination will show further evidence of acute haemolysis. Usually if the transfusion is stopped promptly and adrenalin is administered hypodermically in 15-minim doses every fifteen minutes for several doses, the patient will rally. This type of reaction is usually followed by a sharp chill and a rise in the temperature. Atropin, 1/150 gr. combined with from 1/4 to 1/2 gr. of morphine will be beneficial and will render the patient more comfortable.

Errors in blood grouping may be due to an inexperienced laboratory worker, intern, or medical student carelessness in providing fresh serum or protecting it from bacterial contamination, a marked variation in the agglutinating power of the sera pseudo-agglutination, auto-agglutination, or cold agglutination.

Proteolytic reactions are of the following three types:

1. Febrile reactions with or without chills and unaccompanied by any other symptoms. Of 500 transfusions, 20 per cent were followed by a febrile reaction, and 5 per cent of the febrile reactions were accompanied by a chill.

2. True protein reactions of sensitization evidenced by dermal reactions of erythema and urticaria. About 10 per cent of all individuals show this type of reaction to some degree. Adrenalin is the medicament of choice.

3. Anaphylactoid reactions resembling true anaphylactic shock. Three cases are reported in detail.

The frequency and severity of other reactions may be reduced by

1. The carrying out or supervision of grouping and compatibility tests by carefully and thoroughly trained persons.

2. Further investigation of white cell incompatibility.

3. The avoidance of methods which may involve toxic or early coagulation changes in the donor's blood, such as the citrate method.

4. The use of fasting donors for subsequent transfusions in cases showing febrile reactions or protein sensitization.

5. Skill in operative technique sufficient experience to recognize danger signals, and familiarity with the measures necessary to combat serious reactions promptly.

CHARLES BARNY M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Cutler E. C., and Zollinger R.: The Use of Sclerosing Solutions in the Treatment of Cysts and Fistulae. *Am J Surg.*, 1933 xix, 411

In reviewing the use of chemicals in surgery the authors call attention to the early treatment of cervical fistulae by irrigation with cauterizing fluids. Experiments carried out previously had shown that ferric chloride-Carnoy fluid is the most efficacious sclerosing agent which can be used on living tissues. This consists of 6 c.c.m. of absolute alcohol 6 c.c.m. of chloroform, 1 c.c.m. of glacial acetic acid, and 1 gm. of ferric chloride. It produces rapid fixation with excellent hemostasis and causes less reaction in the surrounding tissues than formalin or Zenker's fluid.

Three groups of cases representing different conditions in which a sclerosing fluid may be a valuable therapeutic agent supplementing the use of the scalpel are discussed. In the first group the ferric chloride-Carnoy fluid was applied to gliomatous cysts of the brain. No unfavorable effects were noted and excellent hemostasis was obtained.

In the second group three cervical fistulae were injected with sclerosing solutions. The fistulae were visualized with lipiodol or a concentrated solution of sodium bromide. As a rule a small sinus tract was found leading from the fistulous opening in the neck to the posterior pillar of the tonsil. The sclerosing fluid was injected through the tract several times, the throat being protected with cotton and the cutaneous opening protected with vaseline or zinc oxide. The fistulous tracts were soon obliterated a difficult operation therefore being avoided.

In the third group of cases the ferric chloride-Carnoy fluid was applied to pilonidal sinuses. The sinuses were exteriorized under local anesthesia and the fixative applied to their walls for an average of ten minutes. The next day the fixed tissue was curetted away and the sclerosing agent re-applied until the wall of the sinus was entirely removed. The cavity was then packed and allowed to fill from the bottom with granulation tissue. Three cases with successful results are reported.

Garlock, J. H.: The Full Thickness Skin Graft
Ann Surg. 1933 xcvi, 359.

As the success of a full thickness skin graft depends largely upon an almost perfect aseptic technique a graft of this type should be placed only on a fresh surgical wound and should not be used for granulating wounds. Its indications are therefore limited to the correction of defects of the skin and subcutaneous tissues immediately after the surgical excision of

pathological lesions or of cicatricial contractures caused by burns or trauma. The prevention of cosmetic defects or contractural deformities following plastic or destructive operative procedures, the replacement of skin following the excision of surface tumors or blemishes, the furnishing of skin for the clefts in the operation for congenital or acquired syndactylism and the replacement of hair bearing skin such as that of the eyebrows.

In the selection of the type of skin graft to be used in a particular case the surgeon must consider a number of factors. There are numerous conditions in certain parts of the body which require for their correction more underlying tissue than a full thickness graft can supply. Under such circumstances, the pedicled skin flap offers greater possibilities. On the back of the neck and on the forehead face, and parts of the torso the full thickness graft can be used with excellent chances of success. However, this form of graft finds its greatest field of usefulness in surgery of the extremities. In addition to supplying adequate tissue it has the added advantage that it can be applied in a one-stage procedure. It will not unite to bone unless a layer of periosteum is present. On the flexor surfaces of the fingers it will very often not succeed if it is placed on exposed tendons. An intact tendon sheath is most desirable. Other factors to be considered in the use of a full thickness graft are future shrinkage, changes in color, the formation of heavy scars at the edges, and the growth of hair.

It is probably wiser to excise a cicatrix completely than merely to make relaxing incisions. In surgery of the extremities the use of an Esmarch bandage permits more rapid excision of the cicatrix and greatly diminishes tissue trauma. After excision of the scar the Esmarch bandage is removed and bleeding is controlled. The capillary bleeding that always occurs can usually be controlled by having an assistant apply firm even pressure with warm sponges while the graft is being removed from the donor site. Before the graft is applied the wound should be absolutely dry. This is probably the most important feature of the operative technique.

A pattern accurately reproducing the size and shape of the wound is next made. The author has been using stiff paraffin mesh gauze as the perforations in the gauze aid visualization of the underlying wound while the pattern is being cut. The pattern is laid on the skin with the epithelial surface up and the outline is accurately marked out with the point of a toothpick dipped in methylene blue or brilliant green solution. With the use of a very sharp small knife the painted outline is then incised down through the full thickness of the skin. In the belief that any form of trauma however slight, will lessen the chances for

a successful take, the author uses a technique in which grasping of the graft by instruments is avoided. Although this procedure is rather tedious, it is justified by its results. A tiny book is made to catch one corner of the graft and, with this as a tractor, the cutting of the graft is begun. As the removal of the graft proceeds, additional books are placed at cardinal points to facilitate the operation. The undersurface of the skin should be free of fat and show white and stippled with tiny depressions. After its removal, the graft, still held by one or two books, is placed, raw surface downward on a warm, moist gauze pad.

The graft is next placed in the wound bed with care to fit it in according to pattern. Because of the care taken to obtain hemostasis, perforation of the graft is often unnecessary. If hemostasis is in complete perforation is indicated in order to prevent the formation of blood clots beneath the graft. The latter complication is one of the most common causes of necrosis.

With the use of fine skin needles, a few sutures of fine horsehair are placed at cardinal points to anchor the graft in place. The remaining edges are approximated with a continuous stitch of horsehair. Accurate apposition of the skin edges is important. It makes for a neater scar and an additional source of blood supply during the first eight or ten days. After the graft has been anchored the entire surface is covered with three thicknesses of gauze impregnated with 2 or 3 per cent zincform ointment. Blair recommends the use of this ointment because it is supposed to be antagonistic to staphylococci which are present in skin and skin grafts. The gauze with the ointment is covered with several thicknesses of smooth gauze and over the latter a large moistened rubber bath sponge is placed. A sterile bandage is then firmly applied. Considerable skill is required to apply the proper amount of pressure. If the pressure is too great ischemia and death of the graft will result and if it is insufficient the graft may be jeopardized by blood clots.

Absolute fixation of the grafted area during the period of healing is most desirable especially in surgery of the extremities. The use of splints to immobilize contiguous joints greatly increases the likelihood of a perfect "take." In the covering of defects on the hand and fingers, fixation is obtained best by the use of splints made especially for the individual case. These are cut out according to pattern from rigid sheet aluminum. They are sterilized and applied at the operating table. They should be worn for at least three weeks.

The wound formed by excision of the skin graft may be closed by undermining the edges and approximating them with silkworm-gut sutures. If tension is present, necrosis of the edges may be avoided by making numerous small releasing incisions in the skin surrounding the sutured wound. This procedure has proved most valuable. If the defect is a large one, it may be partially closed and the remainder then covered with Thiersch grafts.

If the surgeon is satisfied with the asepsis of the operation, the control of bleeding and the fixation of the grafted area, he need not disturb the dressing for from two to two and a half weeks. If the pressure dressing is removed too early blisters form on the surface of the graft and are prone to infection. The latter complication predisposes to ulceration of the graft. The pressure bandage should be maintained for a period of about three weeks, whereas the immobilizing splint may be discarded after the third or fourth week. The grafted area should be protected from possible mechanical or thermal injury for about six weeks.

Overholt, R. H. and Veal, J. R.: The Incidence Character and Significance of Abnormal Physical Signs in the Chest Occurring After Major Surgical Operations. *New England J Med* 1931, *ccviii*, 143.

The authors report a study of the physical signs which occurred in the chest after operation in a series of 200 cases with no abnormal pre-operative physical signs. One hundred of the patients had an abdominal operation and 100 an extra-abdominal operation. All types of anesthesia were used. By far the greater number of changes in physical signs in the chest were found in the cases of abdominal operation. They consisted of a reduction in chest expansion, elevation of the diaphragm, a decrease in resonance at the bases with a decrease in the breath sounds, and an increase in resonance in the upper anterior chest with an increase in the breath sounds. In 45 per cent of the cases of abdominal operation there were persistent râles. In 52 per cent, areas of tubular breathing were found and as a rule were noted on the second or third postoperative day. More abnormal chest signs were present after operations on the upper part than after operations on the lower part of the abdomen. Râles occurred more frequently after general anesthesia while areas of tubular breathing were more common after spinal anesthesia.

These signs are consistent with the reduction of pulmonary ventilation following the splinting of the abdominal muscles and elevation of the diaphragm and the shallow respiratory excursions after abdominal operations. While ordinarily indicative of pneumonia, they do not necessarily mean pneumonia if they are noted during the first few days after operation. Of the 100 patients subjected to an abdominal operation, only 4 developed a true pneumonia. The others had no chest symptoms although many of them presented physical signs in the chest.

Of the patients subjected to an extra-abdominal operation only 15 per cent showed chest signs of an abnormal nature and in these the signs persisted for only one or two days.

The authors point out that even in the presence of signs of consolidation after operation there are frequently no constitutional evidences of infection and the subsequent course suggests an uncomplicated convalescence.

MARY E. MATTHEW, M.D.

Banash J. L. and Carter G. O. Researches in Oxygen Therapy Equipment; Some Aspects of the Mechanical Phases of Oxygen Therapy Apparatus. *Acad & Anal* 1933 xii, 53

Equipment for oxygen therapy is so improved that oxygen therapy is now available quickly and at a reasonable cost. Oxygen can be given in a chamber or tent, by nasal catheter or by face mask. The capacity of the tent varies from 20 to 50 c. ft. Circulation of the oxygen in the tent is obtained by means of a motor or is a thermal circulation. The authors emphasize the importance of proper selection of equipment, its utilization to the fullest extent its maintenance in proper condition, and close observance of rules for safety.

GEORGE R. McAULIFF M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

Penick, R. M., Jr.: The Treatment of Burns, with Especial Reference to the Use of Gentian Violet. *Internat Clin* 1933 i, 31

Penick divides the symptoms of severe burns into those due to shock, blood changes, infection and other complications. In the initial stages several processes blend into one another. The treatment must be directed toward combating the various pathological processes at work.

The first consideration is the treatment of shock. The shock due to a burn in no way differs in cause or indications for treatment from shock produced by other forms of trauma. Associated with or consequent to the shock is a change in the blood. This is manifested by a rise in the hemoglobin, a relative increase in the formed elements, and an increase in concentration. These changes are due to anhydremia. As much as 70 per cent of the total blood volume may be lost through the burned area in twenty-four hours. The greatest disturbance of fluid balance occurs in the first three or four days this being therefore the most critical period.

The so-called toxemia which occurs within about twelve hours after the burn is due to anhydremia and infection. Bacteria become increasingly numerous after twelve hours. Infection is definitely established in about three days. The streptococcus predominates over other organisms. The rapidity of the bacterial invasion makes it an early rather than a late complication.

Because of these facts three processes take place after a severe burn. The initial shock merges with the period of blood concentration which in turn may last well past the time when infection is established. Thus the treatment must combat shock, correct blood concentration, and prevent infection.

In the author's cases of extensive second-degree and third-degree burns the patient is hospitalized given a large dose of morphine, divested of clothing, wrapped in a sheet and placed on sterile sheets covered with a cradle heated to from 85 to 95 degrees F. by electric lights. Fluids are forced by mouth.

Anhydremia is checked by the administration of normal salt solution by proctocolysis in doses of 250 c.c.m. every four hours, by subcutaneous infusions or by intravenous administration. For the latter, normal salt and a 5 per cent dextrose solution are used by the continuous or intermittent method. As a rule the maximum amount desired is 100 cubic centimeters per kilogram of body weight per twenty-four hours. Dirt and grease are removed from the skin if this can be done without trauma. The burned area is sprayed with a 1 per cent aqueous solution of gentian violet every two hours until an eschar is formed. This requires from eighteen to twenty-four hours. Gentian violet is preferred to tannic acid because it has a marked bactericidal action and does not injure the normal tissue.

If the patient survives the initial period and an eschar is formed, efforts are directed toward the promotion of early healing. The coagulum is protected and measures are taken to improve the general condition, prevent anemia and guard against infection. If the eschar does not separate spontaneously it may be removed at the end of about three weeks. This is best done by softening a small portion of it with compresses and increasing the softened area daily. In this way severe reactions are prevented.

Contractures are decreased by early healing, early grafting of raw surfaces, and early restoration of function.

HERMAN E. PEARSE, M.D.

Dolman C. E.: Treatment of Localized Staphylococcal Infections with Staphylococcus Toxoid. *J Am M Ass*, 1933 6, 1007

The toxigenic properties of the staphylococcus have been the subject of renewed interest since the report in 1928 of the Royal Commission of Inquiry into Fatalities at Bundaberg the deaths of twelve children following the injection of a diphtheria toxin-antitoxin mixture contaminated with staphylococci.

It has been demonstrated that under proper environmental conditions, certain strains of staphylococci will produce a true exotoxin the effects of which on cells and tissues are specific and highly destructive. To obtain active immunization of patients with staphylococcal infection against the staphylo toxin Dolman set out to prepare a staphylococcus toxoid by adding a solution of formaldehyde to staphylococcal toxins in a manner similar to that previously described by Burnet and others. After its use under rigid control and with stringent tests on animals, the toxoid was used in clinical cases.

Dolman reports twenty-eight cases of intractable staphylococcus infection which were treated successfully by a series of injections of the toxoid, and thirty cases of various kinds now under treatment, the majority of which have shown remarkably beneficial effects. Cases of recurrent boils invariably responded to the treatment. Pustular acne and furunculosis were quickly cured. As less than a year has elapsed since the first cases were treated, it is too soon to make any definite statement regarding the duration of the immunity gained.

The toxinoid was produced by adding to the staphylococci a 0.3 per cent solution of formaldehyde (U S P). The toxins were obtained by the method previously described by the author from toxigenic strains recently isolated from staphylococcal lesions in human beings.

The toxinoid was injected subcutaneously in a slowly increasing dosage at intervals of from five to seven days. The initial dose of 0.05 c.cm. was given subcutaneously into the arm, and successive doses of 0.1, 0.15 and 0.2 c.cm. were given at intervals of from five to seven days. Four doses were usually given in the first series of injections. These were usually supplemented by a further series of four or more larger doses. The patients were required to report at monthly intervals in order that it might be ascertained whether or not they were free from recurrence of the infection and in order that a specimen of blood might be obtained for estimation of the circulating antitoxin.

In every case the clinical signs of primary staphylococcal infection were confirmed by isolation from the infected site of the toxigenic staphylococcus in pure or almost pure culture.

The treatment is expected to be useful in all types of staphylococcal infections, including boils, carbuncles, bone abscesses, abscesses of the deeper tissues, and sinuses. C. PAUL LAROCHE, M.D.

ANÆSTHESIA

Singleton H. Some Practical Points Applicable to Anæsthesia in Children. *Practitioner* 931 1912, 441.

The forcible induction of anæsthesia causes a considerable amount of psychic trauma to children, particularly those with a high-strung disposition. In an attempt to eradicate the disadvantages of anæsthesia with safety various drugs have been used as premedication. To be safe a drug so used must have no depressing action on the respiration, heart, or blood pressure, must not affect the kidneys, and must be easily eliminated without injury to the tissues.

Paraldehyde ($\text{C}_6\text{H}_{12}\text{O}_3$) is advocated as the drug which fulfills all the requirements for safety. It is a powerful hypnotic without any unpleasant after-effects. It acts quickly. It somewhat strengthens the heart. It has no effect on the respiration or the gastro-intestinal tract. It is a mild diuretic. As it is excreted largely by the lungs the breath smells strongly until its elimination is completed. It has an unpleasant odor but the patient is unaware that his breath smells of it. It should be kept in a cool, dark place as otherwise it may disintegrate with the formation of glacial acetic acid.

Because of its unpleasant taste it should be given by rectum, 1 dr. in 1½ oz. of normal saline solution. It is insoluble in oil and should not be used with oil. The dosage should be 1 dr. to each 14 lb. of body weight, and the mixture of paraldehyde and water should be warmed to a temperature of from

92 to 94 degrees F. before its injection. The injection should take from fifteen to twenty minutes.

The ideal plan is to allow breakfast and morning play as usual in order to permit the occurrence of a normal movement, give the paraldehyde at noon, give a hypodermic injection of atropin at 1 p.m., and operate at 3 p.m.

The ideal anæsthetic is a mixture of ethyl chloride and eau-de-cologne sprayed onto the usual face-piece. The face-piece should be held away from the face to allow anaesthetization of the buccal mucosa. After about 20 breaths, the face piece may be applied to the face and the anæsthetic increased. Either may then be substituted and the child removed to the operating room.

The dosage of atropin should be varied according to age as follows: up to six months of age, 1/400 gr. from six to twelve months of age, 1/300 gr. from one to two years of age, 1/150 gr. and over two years of age, 1/100 gr.

After the operation the child is likely to sleep for from six to twelve hours. He will then awaken for a drink and go to sleep again for from six to eight hours.

According to the author's experience in over 60,000 cases, the ethyl chloride combination recommended is absolutely safe. The primary essential is a free air way. The only difficulty is caused by contractions of the muscles attached to the jaw and temporary inhibition of respiration. The respiration starts again in a few seconds, and further inhalation of ethyl chloride will cause the muscles to relax. Anæsthesia can then progress as usual. There should be no struggling with the jaw during the tonic contractions.

Ethyl chloride is superior to nitrous oxide for dental cases. The open mask held away from the face is much less alarming than having the face covered with a rubber mask and allows plenty of air thereby making the administration of oxygen unnecessary. When the third stage is reached, respiration is deep, even stertorous, the pupils are widely dilated, and the eyeballs are usually rotated downward. At this stage analgesia is complete for a few minutes and the face-piece may be removed for minor work. For tonsillectomy a bellows apparatus with air passed through an ether bottle is necessary. To prevent freezing, the internal diameter of the tube should not be less than ¼ in. The induction of deep anæsthesia by ether with the mouth open is thus made possible. K. S. PLATT, M.D.

Grosuco, T. and Dragos, A.: Some Considerations on 8,000 Spinal Anæsthesias. (*Quelques considérations sur 8,000 rachianesthésies*) *Lyon chir.* 1933, 203, 48.

The authors review their experience with more than 8,000 spinal anæsthesias induced during the last twenty-five years in the Military Hospital at Galatz, Roumania. They used stavaine in 4,500 cases, novocain in 3,300 cases and syncline and tutocaine in 200 cases.

For herniotomies they regard spinal anaesthesia as superior to local anaesthesia because it reduces the length of time required for the operation, it gives perfect muscular relaxation and quietness of the abdomen and it reduces the chances of suppuration. Hernia, eversion, and other conditions of the abdominal wall constituted 75.6 per cent of the cases reviewed.

The authors have employed spinal anaesthesia with great satisfaction for all types of abdominal surgery and for operations on the genital organs, the anoperineal region, fractures and dislocations of the lower extremities, sympathectomies, and amputations. They tried it also for operations on the head, thorax, and upper limbs but abandoned it in favor of local anaesthesia because of severe reactions.

They regard novocain as the anesthetic of choice. They state that it should be given fairly rapidly and that the patient should lie down at once. With regard to the prevention of headache they emphasize the importance of care to prevent loss of spinal fluid and advise the application of cold compresses to the head.

During the anaesthesia, nausea and vomiting occur in from 5 to 10 per cent of the cases. Cardiac and circulatory disturbances such as bradycardia, coldness of the extremities, pallor and feeble pulse occur occasionally. Respiratory difficulty is absent except in high anaesthesia.

Following the anaesthesia, headache may persist for two or three days. In rare cases, vomiting occurs during the first forty-eight hours, and occasionally difficulty may be experienced with the bladder sphincter. Paralysis of the spinal nerves occurred in only 1 of the authors' cases and in this instance lasted six months.

Among the generally recognized contra indications to spinal anaesthesia are hypotension, shock,

septicemia, tuberculosis and uremia. The authors believe that anaesthesia of this type is contra indicated also in (1) the cases of women and children, because of their emotional instability and the difficulty of getting them to remain quiet and (2) the cases of persons with acute or old lesions of the central nervous system.

MARSH W. POOLE, M.D.

SURGICAL INSTRUMENTS AND APPARATUS

Glock, R. O. The Fallacy of Chemical Sterilization of Surgical Catgut Sutures: with Particular Reference to the Use of Copper Salts, Pepper mint Oil and Mercury. *Surg. Gynec. & Obst.* 1933, 161, 149.

In the investigation herewith reported which extended over a period of two and a half years several thousand catgut sutures were prepared from 334 lots of catgut. In addition, 154 commercial lots of catgut purchased in the open market were studied. In an attempt to bring about chemical sterilization, the catgut was treated with 27 chemical compounds under a wide variety of conditions. The various chemical treatments were applied to catgut ribbons, raw catgut strings and artificially infected catgut. Throughout the investigation the standard bacteriological test devised by Melency and Chatfield was used and supplemented by 3 controls.

The results proved quite conclusively that all chemical sterilization procedures are inefficient. In no case did any of the chemicals or combinations of chemicals employed render the catgut entirely free from living bacteria. The author concludes that the only uniformly reliable and positive method of sterilizing catgut sutures is carefully controlled heat sterilization. He states that such sterilization does not impair the tensile strength of the catgut.

ELIZABETH CRAMTON

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Pancost, H. K.: Roentgenology of the Pharynx and Upper Oesophagus. *Am J Cancer* 1933, xvii, 373

Among the indications for roentgenological examination of the pharynx and upper oesophagus are foreign bodies, neoplasms, inflammatory conditions, paralysis injuries, and anomalies. Foreign bodies are discussed by the author only with regard to differential diagnosis.

Roentgen diagnosis of the pharynx and upper oesophagus is rendered possible by the following facts

1. The soft tissues of the neck surround a more or less open, air-containing space above the oesophagus, comprising the oropharynx, pharynx, pyriform sinuses, and larynx.

2. The structures which bound this space cast definite shadows and can therefore be differentiated by contrast.

3. The air space may be encroached upon or displaced by inflammatory swellings or neoplasms.

4. The structures bounding the space can be appreciably and characteristically altered in appearance or displaced by the same processes.

5. A certain normal range of movability of many of the structures can be determined and fixation or restriction in movement can be detected by fluoroscopic observations. These structures include the soft palate and uvula, the tongue, the larynx, and the arytenoid cartilages.

6. The collapsed potential space of the upper oesophagus can be filled with an opaque medium to outline its lumen and location.

7. The dense cervical spine with its fixed relations serves as a means of estimating displacements and the comparative measurements of spaces, their locations, and the thickness of their walls.

The manner in which these various factors may be made to furnish valuable information relative to both normal and abnormal conditions in this region is discussed in detail. The act of swallowing is given special consideration, and specific pathological conditions are described at length.

ADOLPH HARTUNG, M D

Armand Delille, P F, and Lestocquoy G. X Ray Appearance and Types of Evolution of Tuberculosis of the Tracheobronchial Glands (Aspects radiologiques et types évolutifs de la tuberculose des ganglions trachéo-bronchiques). *Presse Méd.*, 1933 xli, 273.

The authors call attention again to the fact that the X-ray has made a great change in the diagnosis of tuberculosis of the tracheobronchial glands, but

that it is only by means of both anteroposterior and lateral roentgenograms that enlargement of these glands can be determined accurately.

In the first part of their article they review the anatomy of the glands and emphasize their relationship to the great vessels, the heart, the trachea, and the bronchi. Five groups of glands are differentiated. (1) the right paratracheal glands in front and to the right of the trachea which, if enlarged, produce a shadow in the right parasternal region where they show clearly against the lung field, (2) the left paratracheal glands, enlargement of which is manifested by exaggeration of the shadow of the aortic arch or deviation of the trachea to the right (3) the right interbronchial glands, which are directly visible at the right border of the heart, but must be distinguished from shadows caused by lesions of the lung parenchyma remote from the hilus (4) the left interbronchial glands, which lie directly behind the heart and can be made out only in an oblique roentgenogram unless they are greatly enlarged and (5) the mediastinal group, which are entirely invisible in anteroposterior roentgenograms, but can be made out with precision in lateral roentgenograms.

Pathologically two types of involvement of these glands are distinguished

1. Tuberculous infiltration. The authors have observed this type of involvement in a number of patients dying of intercurrent disease. The glands are as large as an almond, pink, and of the consistency of liver. They contain few small caseous or calcified areas. Kleinschmidt calls this form "epituberculosis of the hilus glands," regarding it as analogous to the epituberculosis of the pulmonary parenchyma described by Elliasberg and Newland. In association with these gland changes there is a primary tubercle in the lung which is circumscribed and calcified and without any millary dissemination.

2. Massive caseation of the bronchial glands, characterized by large masses of yellowish white caseous material. All of the groups of glands are caseous to an equal degree. In association with such glands the primary focus in the lung is large, caseous, and poorly circumscribed scattered millary tubercles are found, and often a tuberculous meningitis is present.

Corresponding to these two pathological types there are two clinical types, the first regressive, and the second progressive and fatal. The first is diagnosed from a history of family exposure, positive skin tests, and characteristic X-ray shadows. The classical signs of enlargement of the bronchial and mediastinal glands are not often present. The condition is found most often in children between four and seven years of age, and can be followed through the various stages of healing. The second clinical

type occurs usually in nurslings or very young infants as a result of massive inoculation from intimate contact, such as with a tuberculous mother. Occasionally it is seen in older children, but in the latter the glands are not so large and do not show such extensive caseation as in infants. It is characterized by a progressive loss of weight, irregular temperature dehydration, enlargement of the spleen, and the classical physical signs of enlargement of the bronchial glands. Death usually occurs from dissemination of the tubercles. Calcification of the glands with recovery is rare.

In conclusion the authors state that the prognosis can be determined only from a consideration of the clinical picture and a series of roentgenograms made over a period of weeks or months. They advise careful watching of the children, preferably in a sanatorium.

MARSH W POOLE, M.D.

Balestra, G., and Bistolfi, S.: The Indications for X Ray Examination in Traumatic Lesions of the Line of Lisfranc (*L'indagine radiologica nelle lesioni traumatiche della linea di Lisfranc*) *Radiol med.*, 1933, XX, 151

In 27 103 X ray examinations for traumatic lesions of the skeleton the authors made 5460 examinations of the feet. The latter revealed 2997 skeletal lesions of the feet, 30 uncomplicated dislocations and subluxations, 85 dislocations and subluxations complicated by fracture and 2,881 uncomplicated fractures.

The fractures of 1 or more bones of a single segment of the foot were located as follows: tarsus 227, metatarsus 479 and phalanges, 1191.

In 2997 patients there were 5675 fractures located as follows: calcaneum 290, astragalus 73, navicular bone, 13, cuboid bone, 17, cuneiform bone 39, metatarsals, 978 and phalanges 4,255.

The authors discuss the anatomy and the variations in the position of the foot bones in the various positions of rest, walking and running including the long arch of the foot on its outer and inner aspects and Lisfranc's joint at the tarsometatarsal union.

A summary of the article states that from a review of the literature on traumatic lesions of the line of Lisfranc and from their own observations the authors conclude that it is not sufficient merely to consider the multiplicity of injuries to explain the great variety of such lesions. A study of the static-

dynamic equilibrium of the arch of the foot should include the innumerable states of equilibrium often involving minor changes which are passed through by the foot in its many movements.

The authors discuss the different types of fractures and luxations, particularly the less striking lesions which require a careful X ray examination for their demonstration. Of the latter they call attention especially to medial subluxation of the great toe, which is quite frequent. This is characterized by diastasis between the first and second cuneiform and the bases of the corresponding metatarsal bones which often can be determined only by a careful comparison of roentgenograms of both feet. The functional and medicolegal importance of this lesion is emphasized.

The technique of X ray examination of the foot is described briefly and the principal causes of error or doubt in the diagnosis, especially the various accessory and sesamoid bones which may be encountered are discussed.

KILLOGG SPEED M.D.

RADIUM

Becchini G. Radiotherapy of Laryngopharyngeal Tumors (*Sulla radioterapia dei tumori laringofaringei*) *Adinoterapia* 1932 X 111

Becchini reports fifteen cases of laryngopharyngeal tumors treated at the Benito Mussolini Hospital, Alexandria, Egypt. He states that radiotherapy is useless for such tumors. It is unsuccessful in comparatively early cases as well as in those with metastases. In the cases reviewed, the X rays and radium were used alone and combined. Radium was employed most frequently 'not because of its specific action, but because it best fulfilled certain theoretical requirements and its use seemed to be followed by fewer complications.

The technique of treatment, the dosage and the avenues of approach were varied, but the results were almost uniformly discouraging. In several cases radium was applied directly to the lesion but even when this was done the incidence of cure was not increased. Fourteen of the fifteen patients died within twenty two months. In the case of the remaining patient the treatment was given too recently for the end-result to be known.

The author's experience corresponds to that of other laryngologists and radium therapists.

GEORGE C. FROLA M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Van Rooyen, C. E.: A Biological Test in the Diagnosis of Hodgkin's Disease. *Brit. M. J.* 1933, i, 644.

Van Rooyen reports five cases of Hodgkin's disease. In three, the reaction to Gordon's biological test was positive. In one it was doubtful, and in one it was negative. Van Rooyen concludes that Gordon's biological test affords an easy method whereby lymphadenomatous tissue may be differentiated from lymphosarcomatous, leukemic, and tuberculous tissue and therefore may be used as a laboratory aid in the diagnosis of Hodgkin's disease.

MANUEL E. LICHTENSTEIN, M.D.

Gordon, M. H.: Hodgkin's Disease. *Brit. M. J.* 1933, i, 641.

Gordon reports on a pathogenic agent—apparently a virus—which is associated with lymphadenoma. This agent was demonstrated by injecting into the brain and the marginal ear vein of rabbits a suspension of the ground pulp of a gland. After from two to six days the rabbits showed symptoms of meningo-encephalitis, muscular rigidity, incoordination, ataxia, and spastic paralysis. As a rule death occurred at the end of about ten days. Some of the rabbits, however, recovered slowly and when recovery was complete were immune to a second dose of the injected material. Postmortem examination of the rabbits that died showed no characteristic changes except menarismus and some congestion of the meninges. The injection of similar suspensions made from glands in cases of leukemia, sarcoma, carcinoma, tubercles, and chronic adenitis failed to produce the characteristic meningo-encephalitis.

Morphologically minute deep staining spherical granules could be made out by intensive staining of films after they had been suitably fixed. Similar minute bodies have been seen in impression preparations and in smears made from the cut surfaces of the brains of rabbits that succumbed to intracerebral injections of suspensions of lymphadenoma gland. No certain growth of this pathogenic agent under either aerobic or anaerobic conditions has yet been obtained on artificial culture media.

Glands dried in a vacuum desiccator at room temperature in the dark and then sealed in a test tube and kept in the refrigerator preserve the agent in active condition for at least six months. There is evidence that exposure to heat produces some slight weakening or attenuation of the pathogenic agent. It has been found also that the agent will retain its activity when carbolic acid is added to the extent of 3/4 per cent and it is kept for twenty hours at

37 degrees C. When it is refrigerated with phenol it will retain its pathogenicity for at least two weeks. It withstands the addition of 10 per cent of ether for a variable period, but in the course of time is attenuated thereby. The results so far obtained suggest that the pathogenic agent resists phenol better than ether. It can produce an immune serum which will inactivate the pathogenic agent when it is left in contact with a suspension of lymphadenoma gland for two hours in a water bath at 37 degrees C. The meningeal symptoms may be produced also in guinea pigs, but not in mice.

MANUEL E. LICHTENSTEIN, M.D.

Leederich, L., Mamou, H., and Beauchêne, H.: Malignant Lymphogranuloma of the Ulcerating Cutaneous Type and Its Relation to Mycosis Fungoides (Forme cutanée ulcéreuse de la lymphogranulomatose maligne, ses rapports avec le mycosis fungoides). *Presse méd. Par.*, 1933, 311, 377.

In the French literature the authors were able to find the reports of only three cases of malignant lymphogranuloma with cutaneous ulcers.

The skin lesions of this condition may precede or follow signs of localization in glands or viscera. They may be of a diffuse infiltrative character or definite tumor masses. They are not confined to any one portion of the body. They vary in size from those with a diameter of 1 cm. to those as large as the palm of the hand. They may be single or multiple. They are generally round or oval and have a regular sharply defined border. The base of the ulcers is covered with a foetid grayish exudate and bleeds easily when touched. Pain may be sufficient to cause sleeplessness.

In the beginning the ulcers increase rapidly in size, but later their growth is slight. They resist all treatment. Death occurs after from four to eight months from progressive cachexia or intercurrent disease.

The lesions must be differentiated from those of tertiary syphilis, tuberculosis, mycoses, cancer of the skin, and leukemic ulceration.

The authors discuss at some length the similarity between lymphogranuloma and mycosis fungoides as regards the clinical symptoms, gross and histopathological appearance of the lesions, and duration and termination of the disease. They believe that the two conditions are probably separate entities.

The article includes the reports of a case of lymphogranuloma occurring in a woman. In this case the skin masses were in the right pectoral region and there was involvement of the glands in the right axilla. The patient died eight months after the appearance of the ulcers in the skin.

MAURICE W. POOLE, M.D.

Piersall C. E.: Hypodermololiths, with Reports of One Localized Case and One Generalized Case. *Radiology* 1933 xx, 164.

The subcutaneous calcareous concretions which the author designates as 'hypodermololiths' have been called also petrification of the skin' lime gout, calcareous subcutaneous concretions, calcinosis, "granular deposits of lime," "chalk gout" 'dermal concretions, subdermal concretions,' and gout stones. Piersall classifies them as follows

- 1 Localized
 - a. Non inflammatory
 - b. Inflammatory secondary to pressure, trauma or infection.
- 2 Generalized
 - a. Non inflammatory
 - b. Inflammatory, secondary to pressure, trauma or infection.
- 3 Those consisting entirely or chiefly of calcium phosphate.
- 4 Those consisting entirely or chiefly of calcium carbonate

Calcium phosphate concretions are found more frequently in females than in males, and are most common in the first, second, and third decades of life. Their formation occurs more slowly, runs a more prolonged course and tends to be more generalized over the body than that of calcium carbonate concretions. Calcium carbonate concretions are usually found in the fourth, fifth, and sixth decades of life. They are often localized, and are usually associated with scleroderma.

The mode of formation of these deposits is not understood.

The concretions may or may not be surrounded by inflammation and may be hard or soft. They are located chiefly in the subcutaneous tissue and are surrounded by a pseudocapsule formed of connective tissue fibers.

The diagnosis may be made from the findings of roentgen examination alone or in well-developed cases, on the basis of the findings of physical examination and the history. Roentgenograms show small groups of sharply delimited, punctate, streaky, spheroid or mammillated densities usually in and just beneath the skin and in isolated positions.

In cases of localized concretions, surgical drainage or ablation is indicated for the relief of pain. Poultices, wet dressings, or soaking in soap solution may cause softening and drainage. If the blood calcium or phosphoric acid is high, food rich in calcium should be avoided. If hyperthyroidism is present, the thyroid may be irradiated. Parathyroid preparations may be used to lower the calcium content of the blood. Fair results may be obtained with iodides.

The case of generalized hypodermololiths reported by the author was that of a woman fifty-eight years of age. The first manifestations of the condition were lumps in the buttocks which first appeared in 1923. In 1924 the left hip became painful. In 1925 the

right wrist and the hands were swollen for three or four weeks. In 1929 deposits in the region of the left greater trochanter opened and drained for a year. When the patient was seen by the author she was nervous, toxic, and stiff. Physical examination revealed small chalky deposits on the rim of the right ear, a large perforation of the septum, movable hypodermololiths at the inner side of the left knee, plaques under the skin to the right of the right iliac crest and putty like deposits beneath the skin posterior to the left sacro-iliac joint. The skin was dry and atrophic. The woman said that she had not perspired since 1923. The blood pressure was 184/108. The thumbs and fingers were full at the ends on the palmar aspect and presented a few scars of puncture and sinuses. At the margin of one nail and on one finger tip small yellowish deposits were found beneath the epidermis. The palmar part of the right thumb was twice the normal size. It was compressible but tender. The skin was adherent to the masses. Roentgen examination disclosed hypodermololiths near the trochanters and ischial tuberosities, in the skin above the left buttock, at the tips of the thumbs and all of the fingers on either side of both knees on the upper parts of the legs and at the tip of one toe. The basal metabolic rate was +24, the blood sugar 147 mgm per 100 c.c.m., and the blood urea 41.92 mgm per 100 c.c.m. Roentgen treatment was given. In the two years since the treatment the patient has gained 30 lb. She is now free from nervousness and discomfort, but the chalked deposits remain unchanged. The author attributes the improvement in her condition to reduction of the activity of the thyroid and parathyroid glands by the roentgen irradiation.

Piersall's case of localized hypodermololiths was that of a man forty-one years of age. The patient stated that at about the age of puberty he began to have small pustules simulating acne, on the scrotum. He kept them empty for some time by evacuating them, but for several years had let them alone. At examination they presented the appearance of calcified hard, white, oval cystic masses just beneath the skin. They could be enucleated, sac and all by slitting the overlying skin. Physical examination was otherwise negative. No treatment was given.

NORMAN C. BULLOCK, M.D.

Aubertin Lévy and Baciessu: Familial Hemorrhagic Angiomata: Rendu-Osler Disease (*L'angiomatose hémorragique familiale maladie de Rendu-Osler*). *Presse méd. Par.*, 1933 xli, 185.

The condition discussed is called by the authors 'Rendu-Osler disease' because Rendu first described it from hemophilia and in 1901 Osler definitely classified it and called attention to its familial character. It occurs in both sexes but is slightly more frequent in females than in males.

Clinically two stages are distinguished.

1 The hemorrhagic stage which usually begins between infancy and puberty rarely later. In this stage epistaxis is the outstanding sign.

3 The stage during which angiomata make their appearance. This stage is usually reached between the twentieth and thirtieth years. The angiomata are found on the mucous membranes and the skin, usually at both sites. Hemorrhage may be sufficiently frequent and severe to cause secondary anemia. The blood findings show little of definite importance.

In the period before the appearance of the angiomata the diagnosis is difficult.

As it is impossible to prevent the appearance of the angiomata, cauterization, electrocoagulation, or the use of carbon dioxide snow may be resorted to if the site of bleeding can be reached otherwise the treatment must be that of secondary anemia.

MARIE W. POOLS, M D

Nystroem, G: The Frequency of Sarcoma in Different Age Groups (Die Frequenz des Sarkoms in verschiedenen Altersklassen) *Upsala Lakartidn.* 1932 xxxvii, 1

In 1932 the author compiled statistics on 505 cases of sarcoma by means of a questionnaire addressed to Swedish physicians. In addition, 918 cases were taken from the official Swedish mortality statistics for the years 1913 to 1916 inclusive. The investigation reported in this article covers the years 1911 to 1929 inclusive and a total of 4,447 cases.

One table shows the absolute number of sarcomata and the percentage of sarcomata in the total number of cases as compared with the carcinomata in the period from 1911 to 1928 inclusive. Another table shows the average annual mortality per 100,000 of the average population in corresponding age groups. The fatalities from sarcoma of the group under five years of age during the period from 1913 to 1923, inclusive are compared with those summarized in the tables for the individual years of five-year periods. Curves show the frequency of the fatalities from sarcoma and fatalities from carcinoma.

The statistics show that the widely prevalent opinion that sarcoma, in contrast to carcinoma, occurs most often in young persons is incorrect. Of the 4,447 tumors believed to be sarcomata, 2,080 were proved biologically to be sarcomata. The frequency of sarcoma is only a little over 3 per cent of the frequency of carcinoma. However the absolute frequency of sarcoma is greater in children and in the early years of youth. Up to the age of fifty years the relative frequency of sarcoma in relation to all cases of sarcoma is greater than the relative frequency of carcinoma to all cases of carcinoma. In both sexes the absolute and relative frequency of sarcoma increases in relation to the population in the corresponding age groups, even up to the sixtieth and seventieth years of life except that a peak is reached in the first five years of life.

Therefore, aside from its relatively more frequent occurrence in the years of childhood and youth, sarcoma has an age curve that by and large, corresponds to that of carcinoma. A. STARR (2)

GENERAL BACTERIAL, PROTOZOAN AND PARASITIC INFECTIONS

Nanus, J., Jonnesco, D., Chaudlan, L., and Brull, A.: Pure Gonococcal Septicemia (Septicémie gonococcique pure) *Procs. med., Par.* 1933 xli, 194.

The clinical manifestations of gonococemia are extremely varied, ranging from a simple transitory bacteremia which precedes all extragenital localization to a septicopyemia of long duration. As a rule the gonococemias may be divided into the following two large classes:

1 The theoretically admitted transitory bacteremias, during the course of which the organism is only rarely isolated from the blood, but its presence in the blood is betrayed by hematogenous localization of infection.

2 The septicemias proper in which the bacterium enters and multiplies in the blood, producing clinical symptoms of general infection. This class includes the following two types of conditions of very dissimilar incidence:

a. The septicemias with multiple metastases, especially articular and endocardial, to which the great majority of cases belong.

b. The pure septicemias, in which the gonococcal infection manifests itself exclusively by symptoms of general infection. This type is exceedingly rare, only a very few cases having been reported in the literature (Diehlafy, Faure Beaulieu, Triple and Rizer, Well and Colerant, Trancu Rainer).

The case of pure gonococcal septicemia reported by the authors was that of a man thirty-two years of age in whom the condition developed eleven years after the initial urethral infection. The clinical picture was that of an intermittent fever of long duration (eighty-seven days) with slight splenomegaly, leucocytosis, and polymorphous of an accentuated and progressive type. The general condition was always satisfactory except immediately after the attacks of chills and sweats, when the patient felt exhausted and depressed. These attacks occurred at the same hour daily. This fact together with the splenomegaly suggested malaria, but the leucocytosis with polymorphous, the absence of hematuria, and the resistance to quinine excluded that disease. The macular eruption on the skin of the abdomen at first suggested typhoid. Later there was a urticarial eruption which was attributed to the quinine. After the patient's admission to the hospital the macular eruption again appeared, but subsided after four days. Six days later it re-appeared in milder form. As the symptoms pointed to general infection, lantol, septicimine and finally pyroformin by intramuscular injection were tried. However this treatment was without result.

Intermittent fever splenomegaly and transitory cutaneous eruptions are common symptoms of gonococcal infection. The septicemia in the case reported should be interpreted as an autogenous infection of prostatic origin which was favored by a

number of factors such as alcoholism and fatigue leading to pelvic congestion and diminishing the general resistance. The infection had remained latent in the prostate for eleven years. The importance of latent prostatitis as a focus of infection is evidenced by the fact that Knack and Simon discovered virulent gonococci in 160 of 326 autopsies. The intermittent fever with intervals of apyrexia in the case reported was caused by successive daily discharges of bacteria from an active focus of infection which was latent only in the sense that local symptoms were absent. Treatment with colloidal metals, specific stock vaccine, and anti meningococcal serum proved futile but rapid and complete recovery followed a fixation abscess. EDITH S. MOORE.

DUCTLESS GLANDS

Aron M. Van Causlaert C. and Stahl, J.: *Studies of the Diagnosis of Functional Disturbances of the Anterior Lobe of the Hypophysis—Prehypophysis—and of Certain Endocrine Disturbances in Which They Participate (Recherches sur le diagnostic des troubles fonctionnels du lobe antérieur de l'hypophyse—préhypophyse—et sur certains déséquilibres endocriniens auxquels ils participent)* *Presse méd., Par.*, 1933 31, 1981.

Until recent years the hypophysis was considered of little importance. It has now been

found to contain at least three hormones which stimulate respectively the activity of the thyroid gland, the activity of the sex glands, and growth. Diseases of the thyroid or genital glands may be brought about in those glands secondarily by excess or deficiency of the secretion of the anterior lobe of the hypophysis. As examples, the authors cite cases of Basedow's disease and hypothyroidism, acromegaly, the adiposogenital syndrome, obesity, and diabetes insipidus. In these conditions treatment with extract of the hypophysis rather than with extract of the thyroid or sex glands may be indicated.

The authors state that there is probably a very delicate balance between various endocrine glands and that these may not be the only factors involved. Every effort should be made to ascertain the condition of endocrine balance by determinations of the basal metabolism (which however may not be dependent on the activity of the thyroid alone), roentgenography of the sella turcica, and determinations of the content of thyro-stimulin of the anterior lobe of the hypophysis and of glucose in the blood or urine. In many cases in which the hormone is insufficient its administration seems to be indicated. When active preparations of the anterior lobe of the hypophysis are available to the practitioner the therapeutic test may be made.

AUDREY GOSN MORGAN, M.D.

BIBLIOGRAPHY of CURRENT LITERATURE

NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THE ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

SURGERY OF THE HEAD AND NECK

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COLLECTIVE REVIEW

THYROID LITERATURE OF 1932

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THE thyroid gland continues to be a subject of undiminished interest, as is evidenced by the sustained volume of literature concerning it and its diseases. Although no new achievements of outstanding significance were recorded during the year 1932 it seems, at least that the ground previously gained is being consolidated. In general, there is a convergence of opinion regarding many phases of the subject, dispelling much of the confusion which has heretofore made it so difficult to understand. There is much greater unanimity in the matter of classification, and a simple nomenclature is finding wider acceptance. Although conflicting claims are still made for various therapeutic measures, the test of time has permitted the elimination of much that was unworthy and a proper evaluation of that which has been retained. The lag between the literatures of the several nations noticeable a few years ago seems to have been largely equalized. From the clinical point of view conditions of hypothyroidism and the obscure and atypical manifestations of hyperthyroidism have occupied attention, ordinary thyrotoxicosis apparently being sufficiently familiar to merit little further discussion. Advances have been scored in the physiology of the thyroid gland, especially with regard to the relation of the thyroid to other glands of internal secretion and to normal and pathological iodine metabolism. Surgical therapy has been accepted as the treatment of choice for hyperthyroidism, and the highly creditable results obtained constitute a brilliant achievement of the medical sciences.

ANATOMY AND PATHOLOGY

Several years ago Williams reported anatomical studies of the thyroid gland which were at variance with the prevailing views and upon which they postulated a new type of hyperthyroidism. Among the changes he described a closed lymphatic system within the thyroid and the thyroid gland explained the thymic participation in the development of toxic goiter. Chouk (38) studied the lymphatic system of the thyroid gland by means of cadavers and by injection of India ink. He failed to disclose anything which would be interpreted as a closed lymphatic system within the two organs.

Zechel (207) calls attention to the type of thyroid cell, of Langendorff as "chief" cells, which are larger than the chief cells and are irregularly distributed in the follicular spaces. They contain a small amount of colloid and are concerned functionally with the new follicles the production of which is the inception of a continuation of his studies in rabbits. Webster (15) in rabbits, Webster (15) stage of hyperplasia the entire of "chief" cells a sudden transition to a cell type in different rabbits. These same cells have

dogs by Nondex (143) and Raymond (160) Nondex believes they probably represent a second type of epithelial cells endowed with secretory capacity.

The significance of lymphoid tissue in the thyroid gland continues to be a disputed subject. Himmelberger (85) found areas of lymphatic tissue in the thyroid glands of 2.8 per cent of infants and in about 2 per cent of persons dying of injuries or diseases not involving the thyroid gland. Such foci are present in practically all thyroid glands removed from patients with Grave's disease. Himmelberger concludes from these findings that the small percentage of persons whose thyroid glands contain lymphatic accumulations coincides with the percentage of those possessing the "Grave's constitution," postulated by Warthin, and that exophthalmic goiter is the clinical manifestation of a congenital constitutional anomaly. He believes that the lymphatic infiltration is diagnostic of hyperthyroidism.

Considerable difference of opinion still exists as to the site of action of the thyroid hormone. McEachern (125) made direct measurements of the oxygen consumption of isolated surviving auricles from hearts of normal and thyrotoxic guinea pigs. He reports a definitely increased oxygen consumption in preparations from thyrotoxic animals, indicating that thyroxin acts directly upon the tissue cells. Myhrman (135) and von Verébely (194) by indirect means, arrived at different conclusions. The former found no acceleration of tissue oxidation whatever. The latter states that of all preparations studied, only in the case of brain tissue could increased oxidation due to thyroxin be demonstrated. He concludes that the action of thyroxin is indirect, and that, *in vivo*, the brain is the intermediary structure.

The weight of the normal thyroid in the newborn has been studied by Leidenius (113) and compared with the body weight. The average weight found was 3 gm. In general, in infants of the same body length, the thyroid was larger in those of lower weight. Leidenius suggests the possibility that activity of the thyroid during the last months of fetal life may be responsible for the lower body weight. Wyatt, Weymuller and Levine (204) studied the calorific action of thyroid extracts in normal infants. Following the administration of such extracts they found increased metabolism and clinical symptoms characteristic of spontaneous hyperthyroidism. The minimal amounts of extract effective in normal subjects greatly exceeds that in individuals with hypothyroidism. Topper and Muller (188) studied the basal metabolism of normal children

of an older group. They found an increased metabolic rate in the prepubescent period, which varied in degree and duration in different children. During this period, some of the children exhibited symptoms of thyroid overactivity such as enlargement of the thyroid gland, tremor, nervousness, vasomotor instability and tachycardia, all of which disappeared as the basal rate returned to normal when puberty was well established. Topper and Muller believe the increased metabolic rate during puberty to be physiological, and emphasize the necessity of considering this phenomenon in evaluating clinical pictures during this period. It should not be confused with true exophthalmic goiter which is rare before adolescence.

Jenkins (95) reports careful studies of the limits of error in basal metabolism determination and the range of normal metabolic rates. He suggests that all cases deviating from 10 to 17 per cent from the zero point be regarded as "doubtful." He has made a large number of determinations of the "basal pulse complex," and has derived a formula for computing this complex from the basal pulse rate and the basal pulse pressure. These values are comparable with those of basal metabolism determinations and may be used as confirmatory findings.

Thyroid activity during pregnancy has been the subject of several studies. Soule (179) confirmed the finding of Anselmino and Hoffman that a substance is present in the blood serum of pregnant women which, on injection, lowers the liver glycogen of the mouse. This substance represents an increased quantity of thyroid hormone and is evidence of an actual physiological hyperfunction of the thyroid gland during pregnancy. Nakamura (138) found an increase in the iodine output during pregnancy indicating increased thyroid activity. In the early puerperium, the output was greatly delayed, which implied hypofunction, but it returned to normal from nine to eleven days post partum. The injection of placental extracts increased the iodine excretion in normal, but not in thyroidectomized, rabbits. Nakamura concludes from this fact that the placenta is the source of stimulation to increased thyroid activity during pregnancy. Niederwieser (141) found the basal metabolism of pregnant women to be elevated from 14 to 18 per cent near term. The greatest increase occurred in goitrous subjects. No disturbances were noted in the course of pregnancy and no changes were found in the offspring.

Two phases of the physiology of the thyroid gland which received the greatest attention dur-

ing the past year were the relation of the thyroid to the anterior lobe of the pituitary, and the question of thyroid and iodine metabolism. The latter subject is inseparable from that of goiter and will be discussed with that condition. Since hyperplasia of the thyroid gland following injections of extracts of the anterior lobe of the pituitary gland was reported by Loeb and Basset in 1930 this observation has received widespread confirmation and there has been rapid extension of the investigations to include the physiology and chemistry of the thyroid gland, blood iodine determinations, and studies of the metabolism following the injection of active pituitary extracts. Closs, Loeb and McKay (39) found an increase in the alcohol soluble iodine level in the blood and a fall in the iodine content of the thyroid gland following injections of extracts of the anterior lobe of the pituitary gland. These changes coincide with those noted in Graves' disease in man. Houssay, Biasotti, Magdalena, and Mazzocco (88-89-90) report that, in the laboratory animal, hypophysectomy prevents compensatory hypertrophy following subtotal thyroidectomy. Increased thyroid activity following injections of extracts of the anterior lobe of the pituitary gland, as indicated by lowered resistance to oxygen deprivation, could be demonstrated in the normal but not in the thyroidectomized animal. Schneider (172-173) observed symptoms of hyperthyroidism including elevation of the basal metabolism and an increase in the blood glycogen following the use of pituitary extract. Histological changes were seen after four days and an elevation of the blood iodine was found some time later. Schneider's blood iodine findings differed from those in true spontaneous hyperthyroidism in that, in Basedow's disease, only the alcohol-insoluble fraction is increased whereas following injections of pituitary extract both soluble and insoluble components were elevated. Grab (74, 75) made similar findings. He reports also a decrease in the iodine content of the thyroid and an increase in the blood iodine especially of the alcohol-insoluble fraction and after three days, an increase in the iodine excretion in the urine. Junkmann and Schoeller (100) isolated the thyrotropic hormone of the anterior lobe of the pituitary gland in a considerable degree of purity. They found it heat labile and inactive on oral administration. It is not identical with the gonadotropic hormone and is not found in the extracts derived from urine or in commercial preparations. Schittenhelm and Elsler (170-171) found increased resistance to acetonitril and greater sensitiveness to lowered oxygen tension. They gave the extract

by mouth to a series of human subjects and recorded palpitation, fever, nervousness, tremor, tachycardia, and elevation of the basal metabolic rate. No improvement in the clinical picture or change in the metabolism was observed in myxedema, although the blood iodine rose. In obesity it resulted in loss of weight. Eitel and Loeser (59-60) describe a method for the isolation of the thyrotropic hormone. They observed morphological changes in the thyroid within two hours after its injection. The liver glycogen was lowered following its use. They too used it for human subjects, and found it capable of producing an active increase in thyroid function.

Loeser (119) also investigated the effect of thyroidectomy on the relation between the anterior lobe of the pituitary gland and the ovary. He found the typical effect of the anterior lobe of the pituitary gland upon the ovary in animals totally thyroidectomized. Bokelmann and Scherzinger (20) compared the thyroid glands of normal and castrated female rats. Removal of the ovaries resulted in atrophy and reduction of the iodine content of the thyroid. The effect of thyroidectomy upon the amylolytic properties of the saliva and upon the blood amylase was investigated by Gayda (72). He found no effect on the composition of the saliva, but the blood amylase fell with increasing myxedema, as part of the general decrease in body metabolism. Davis, Hinton, and Killian (49) studied the relationship between the pancreas and the thyroid gland. Ligation of the pancreatic ducts in dogs had been found to result in the production of colloid goiter. They found no diminution in the blood tyrosine and the administration of tyrosine did not prevent the development of goiter. Therefore the goiter is not due to a decreased tyrosine supply as the result of interference with proteolytic digestion. The administration of iodine also failed to prevent the development of goiter. Davis, Hinton, and Killian believe their results suggest a relationship between the pancreas and the thyroid.

GOITER

The newer literature reveals much greater agreement as to the classification and terminology of goiter. Particularly in those works appearing in the English language the nomenclature recommended by the American Association for the Study of Goiter is widely accepted. According to this classification, 4 types of goiter are recognized: non-toxic diffuse goiter, toxic diffuse goiter, non-toxic nodular goiter, and toxic nodular goiter. The nodular goiters in both groups are being looked upon more and more as the end stages of

the changes causing the diffuse enlargements. The conception of the nodules as benign neoplasms is being abandoned, and the term adenoma is rarely employed in speaking of them. Rice (162) compared the incidence of nodules in thyroids removed routinely at autopsy from patients without thyroid disease with that in thyroids surgically excised. He found them as frequent in the postmortem, physiologically normal glands as in the surgical specimens. The incidence increased with advancing age in both series and, in persons between seventy and seventy-five years of age 100 per cent of the glands were found to contain nodules.

Rice compared also goiters from the state of Minnesota with those from the canton of Bern, Switzerland (163). He found no fundamental differences in the two series, but the percentage of the various types differed in the two localities. Toxic goiters were strikingly less frequent in the Swiss material. The glands from Bern were larger than those from Minnesota. Hellwig (83) studied the thyroid material from Kansas, and found that North American goiter resembles that of the plains regions of Europe—Northern Germany, Holland, and the Russian lowlands—rather than the endemic goiter of the mountainous regions. In North America, diffuse goiter is more prevalent than nodular goiter; non-toxic parenchymatous goiters are uncommon, and toxic goiter is much more prevalent. Little has been added toward determining the relation between simple and toxic goiter. McClure (123) however found a tremendous reduction in the incidence of non-toxic diffuse goiter in Michigan since the introduction of iodized salt. During the same period there has been a striking diminution in the number of goiter operations in that state. Since surgical goiter is usually toxic goiter it appears that iodine prophylaxis is at least a factor in the prevention of toxic and nodular goiters.

Iodine metabolism. In general, studies of blood iodine have confirmed Lundie's assertion that the blood iodine can be separated into two fractions, one alcohol-soluble and the other alcohol-insoluble. Dodds, Lawson, and Robertson (54) have also confirmed the finding that the insoluble fraction is elevated in patients with toxic goiter and is reduced by iodine medication. The fall in blood iodine is not always associated with an amelioration of the clinical symptoms and a lowering of the metabolic rate. Schlittenhelm (169) states that the mode of excretion of iodine depends on the functional state of the thyroid. Normal and hyperthyroid subjects excrete most of orally administered thyroxine iodine in the urine but

persons with myxedema excrete it in the stool. Inorganic iodine and the iodine in ordinary food is always excreted in the main, by way of the urine. In health, the blood iodine level is constant. Its fall definitely indicates hypofunction of the thyroid gland. It is increased in hyperthyroidism, but the increase does not parallel the severity of the disease. X-ray treatment lowers the iodine level. Schlittenhelm believes that the brain, particularly the medulla, is a major factor in iodine metabolism, and that the anterior lobe of the pituitary gland is another. The thyroid is included in the system, but is not the center of it.

In a series of contributions on the relation of iodine to goiter Bretnier (26-30) retains his morphological-functional conception of the different types of goiter. He found the peak of the blood-iodine curve to occur in February coinciding with the most frequent onset of goiter and indicating a seasonal influence. Continuing his studies of the iodine content of blood from the thyroid artery and the thyroid vein, he found the venous blood to contain more iodine than the arterial blood. In all types of goiter the iodine content of the systemic venous blood is 60 per cent lower than that of the thyroid venous blood and 50 per cent lower than that of the thyroid artery blood. In thyrotoxicosis, the thyroid gland is poor in iodine and colloid, and the blood iodine, particularly the organic fraction, is elevated. Under the influence of increased sympathetic tones, the hyperactive thyroid gland excessively produces and immediately excretes its active principle. Externally administered, iodine inhibits the exaggerated sympathetic tone, slowing both production and transportation of the thyroid secretion. Therefore, with iodine medication, the iodine and colloid of the thyroid gland are greatly increased as the active secretion is stored; the inorganic blood iodine rises sharply and the organic fraction drops toward normal.

Jordt (97) compared the biological value, iodine content, histological structure and clinical picture of different types of goiter. In cases of adenoma, a high iodine content usually indicated a high colloid content and greater biological activity and seemed to parallel clinical activity. In diffuse goiter the iodine treatment increased the iodine content and biological activity but reduced clinical activity. These differences suggest a fundamental dissimilarity in the two forms of hyperthyroidism, probably dependent upon dysfunction in thyroid secretion, the nature of which is as yet unknown.

Gutman, Benedict, Baxter and Palmer (78) found that the administration of iodine to pa-

tients with exophthalmic goiter resulted in an increase in both the inorganic iodine and the thyroglobulin iodine content of the thyroid gland. The chemical nature of the thyroglobulin fraction is altered by an increase in the thyroxine iodine and a decrease in the non thyroxine compounds, chiefly of di-iodotyrosine. These changes constitute a return from the more or less depleted state of the untreated exophthalmic goiter gland toward that of the resting gland.

Blood picture and goiter Studies of the blood picture in the presence of various types of goiter revealed no constant or striking changes. McCullagh and Dunlap (124) report a slight reduction of haemoglobin and a relative lymphocytosis in both hyperthyroidism and hypothyroidism. The red cell count in hyperthyroidism was normal and the lymphocyte count fell after thyroidectomy. Hoskins and Jellinek (87) observed the effect of thyroid medication on the blood picture. The average erythrocyte count was significantly increased and the leucocytes slightly diminished following thyroid medication. The diminution of leucocytes affected chiefly the polymorphonuclear cells, whereas the lymphocytes were relatively increased. A biphasic action was noted the effect being reversed if optimal dosage was exceeded. Hoskins and Jellinek conclude that thyroid medication is of general utility in the treatment of secondary anemia, and that age, nutritional status, basal metabolic rate, dosage, and duration of treatment are significant factors in determining the degree of effect obtained. Gamow's (71) studies of the blood picture in a group of patients with non-toxic goiter revealed a low red cell count, usually of four million, with a relatively high color index, the haemoglobin being normal or above. These changes are attributed to diminished erythropoiesis. The patients, most of whom were children, were dyspnoeic and in poor general condition. A definite lymphocytosis was present in most instances. In myxoedema, anemia is frequent, according to Lerman and Means (114) and to Oliver Pascual, Montejo Galan and Oliver (145-146) but responds to combined treatment with thyroid, liver and iron.

Oliver Pascual, Montejo Galan, and Oliver investigated also the relation of the thyroid gland to haemoglobin metabolism. They report a series of cases with low basal rates accompanied by anemia and a diminished urobilin excretion. Thyroid medication elevated the haemoglobin level, the urobilin output, and the basal rate. In hyperthyroidism there was excessive activity of the hematopoietic system with hyperbilirubinemia

and increased urobilin excretion. These findings, as well as the basal rate, diminished following the ingestion of splenic extract. The conclusion was drawn that in patients with hyperthyroidism there is a constitutional anomaly of the reticulo-endothelial and hematopoietic systems. Tschernozatonskaia (190) found an acceleration of the erythrocyte sedimentation rate in the presence of hyperthyroidism and a slowing of this rate in hypothyroidism. The degree of aberration from the normal roughly paralleled the severity of the clinical picture.

Arthritis occurs in both hypothyroid and hyperthyroid states, according to Duncan (55). The arthritis of hypothyroidism is of the hypertrophic type and responds to thyroid medication. In hyperthyroidism, atrophic polyarthritis occurs. Adequate surgical therapy gives astonishing relief from pain and deformity. If delayed too long irreversible changes result.

Goiter and pregnancy Pregnancy throws an added burden upon the thyroid apparatus. Davis (48) urges the administration of iodine during pregnancy and lactation for the relief of thyroid dysfunction in the mothers and the prevention of congenital goiter and cretinism in the children. Frazer and Ulrich (65) are in accord with this view, and state, in addition, that simple goiter may develop during pregnancy and can be prevented by the administration of iodine. Surgery for simple goiter is indicated only if pressure symptoms are produced. Thyrotoxicosis has its beginning during pregnancy in 3.2 per cent of the cases. Frazer and Ulrich advise against interruption of pregnancy because of hyperthyroidism. Mild cases may be carried to term on iodine. Severe ones should be operated upon during pregnancy. Day (50) points out the infrequency of pregnancy and the high incidence of abortion or premature labor in hyperthyroidism. His recommendations as to management coincide with those mentioned. Kuestner (104) advises thyroxine in the treatment of eclampsia, particularly in the early stages or the pre-eclamptic period. This therapy is based on the assumption that hyperfunction of the posterior lobe of the pituitary gland is responsible for the eclampsia and that the thyroid is antagonistic to the posterior lobe of the pituitary gland.

SIMPLE GOITER

The etiology of endemic goiter continues to be one of the perplexing problems of current thyroid literature. According to most observers, iodine deficiency is a factor but not the only factor and according to some, it is not the primary factor.

However thyroid changes can usually be prevented by the administration of iodine. In other words, various factors, nutritional, hygienic, and specific, provoke an augmented thyroid function in the absence of an adequate iodine supply. This increased demand manifests itself by morphological hypertrophy and hyperplasia of the gland. Summarizing the findings of a continuation of his pioneer investigations of simple goiter McCarrison (122) points out the normal fluctuation in size of the thyroid gland from day to day, from season to season, and at certain stages of bodily development and of physiological periods requiring increased thyroid activity. The growth curve of the gland as compared with the body weight at the various stages of life he characterizes as the life line of the thyroid gland. Enlargements of the thyroid beyond two and one-half times their standard deviation he considers abnormal, or goiter. The incidence of goiter follows the normal curve of thyroid enlargement and is affected by geographical location, season, and conditions of life and is profoundly affected by dietary influences. The concentration, in certain localities, of influences tending to elevate the curve imparts to goiter its endemic character. Some of these influences appear to be operative mainly in childhood, others during the period of attainment of full statural development, and others throughout the entire span of life. Under the latter circumstances, the stigmata of goiter—congenital goiter, cretinism, deaf-mutism, and varying grades of physical and psychic degeneration—appear in the newborn of the species. In order of decreasing importance the goitrogenic influences are dietary and hygienic faults and iodine deficiency. In McCarrison's experiments, dietary faults include excesses of fats and lime deficiencies of vitamins, iodine, or phosphates or positive goiter producing substances such as are present in cabbage and some similar vegetables. Insanitary conditions augment the goitrogenic qualities of improper diets, but do not produce goiter in animals on adequately balanced diets. The findings with relation to iodine were indefinite and inconclusive. Iodine deficiency, *per se* is not the cause of goiter but iodine definitely counteracts goiter-producing factors. Thyroid, manganese, phosphates, and vitamins are as powerfully antigoitrogenic as iodine but are less uniform in their action.

Webster (198) summarizes the significant studies being made by his group on experimental goiter. They have found that cabbage feeding produces hyperplastic goiter in rabbits. Steaming increases this goitrogenic activity while iodine

administration counteracts it completely. The metabolic rate of the goitrous animals is lower than normal, but becomes greatly increased if iodine is administered. As yet, attempts to isolate the goitrogenic principle have not been successful. Jackson and Pan (94) found no increase in the weight of the thyroid in animals reared on a low iodine diet as compared with controls receiving a normal iodine supply.

Abbott (1) made a survey of simple goiter in Winnipeg school children. He found thyroid enlargement to be endemic, although its incidence has apparently been reduced more than 50 per cent in the past four years by prophylactic therapy. The widespread use of iodized salt is probably the most important factor in this decrease. In boys, the incidence of the condition reached its maximum at the age of thirteen years and then subsided, but in girls it continued to increase after that age. Among the causes are septic teeth and tonsils. Race is also a factor. Thyroid enlargement is most prevalent in the children of central European and Jewish immigrants. Its frequency in the former is attributed by Abbott to diets in which cabbage is a dominant constituent, and its frequency in the latter to poorly balanced diets rich in fat. Smith (175) points out that the influence of iodine in the prevention of simple goiter depends less upon the amount of iodine available than upon the amount utilized by the organism. Solar radiation is an important factor in iodine utilization. In the United States areas of endemic goiter coincide with regions of deficient sunlight. A similar relation obtains in India and New Zealand. Studies have revealed also that the iodine content of vegetables varies with solar radiation. Josa (98) found a parallel between goiter incidence and lack of iodine in the drinking water in Hungarian goiter regions. He considers iodine insufficiency the chief cause of goiter although other factors, such as the unfavorable post war living conditions, may initiate the disease. Stott (132) surveyed the United Province with regard to endemic goiter. He found the typical endemic goiter to be a diffuse colloid goiter in which nodular cystic degeneration with fibrosis occurs. Its causes he believes to be an excessive intake of lime in the drinking water, insufficient iodine, and intestinal infection from contaminated drinking water. Of these he regards the excess of calcium as the most important. Ucko (191) reviews the world literature of the last eight years concerning the iodine deficiency theory of goiter and concludes that there is no single cause for goiter. He considers goiter a simple hypertrophy in response to in-

creased physiological stimulation. The relation of iodine supply to this hypertrophy is not understood. Familial goiter occurring in non-endemic regions is reported by Bing (18) and by Meulenbracht (129).

Leffmann (111) examined 349 thyroids of patients who died with acute and chronic infectious diseases. He observed loss of colloid, epithelial desquamation increased connective tissue and hyperemia. The changes are totally non-specific in character. Walcher (196) reported 5 cases of congenital goiter 2 of which caused death by suffocation. Busch (154) found a calcareous arterial lesion in 56 of 100 goiters examined. It was independent of the patient's age or blood pressure, the duration or structure of the goiter or the clinical picture. It was found occasionally even in the normal thyroid, but not in thyroids of fetuses or newborn infants. Morphologically it is a degenerative process consisting of hyalin degeneration and calcification of the elastic intima. In more advanced cases, the media is also calcified. Hülle (80) reported a series of cases of simple goiters which disappeared following the removal of diseased tonsils. He considers the goiter secondary to the tonsillar infection. Pfeiffer (152) points out that minute amounts of iodine may produce severe disturbances in sensitive persons, although larger quantities occurring naturally in food and drinking water are well tolerated. He assumes, therefore, that the biologically assimilated iodine combinations are better tolerated than iodized salt, and recommends the feeding of iodine-rich plants to milk animals in order to provide biologically assimilated iodine. Wolfsohn (203) also fearing the danger of iodine administration to persons intolerant to the drug suggested a skin test for iodine sensitization consisting of the intradermal injection of a minute amount of iodine solution. A questionnaire (103) concerning goiter brought 58 replies from various countries and revealed a lack of general belief in any one cause of goiter. Iodized salt was not considered the final solution to the goiter question, and uncontrolled iodine administration was considered injurious and dangerous.

TOXIC GOITER

Interest in the question of toxic goiter continues to dominate the entire subject of the thyroid gland, as is attested by the profuse literature. The differentiation between exophthalmic goiter and toxic adenoma and between primary and secondary forms of hyperthyroidism is being increasingly limited and as a rule all forms of toxic goiter are discussed together.

Etiology and pathology According to most recent writers, the cause of hyperthyroidism is not to be sought primarily in the thyroid gland itself. This gland is thought, rather, to be stimulated to excessive activity by impulses arising elsewhere. The initial source of the hyperfunction is attributed to various causes. The experiments previously mentioned, in which injections of extracts of the anterior lobe of the pituitary gland resulted in enlargement and hyperplasia of the thyroid gland, with loss of weight and elevation of the basal metabolism and lowering of the iodine of the thyroid with simultaneous elevation of the blood iodine, have suggested to the investigators that the origin of the disease is in the nervous system and that the thyroid gland is involved secondarily. Barker (13) points out that the clinical symptoms in the thyrotoxicopathies are referable to alterations in tone of the vegetative nervous system, including both the sympathetic and the parasympathetic divisions, with predominance of the excitatory elements over the inhibitory elements. Autonomic imbalance as the predisposing factor plus immediate causes such as infections or intoxications are necessary for the development of thyroid disease. The effect of iodine is attributed to its sedative action upon a hyperexcitable nervous system. Friedgood (67-68) points out the similarity in the clinical pictures of exophthalmic goiter and lymphatic leukemia even to their therapeutic response to iodine. From his data he concludes that exophthalmic goiter is not a disease of the thyroid gland, but that, like chronic lymphatic leukemia, it is primarily a disturbance of the sympathetic nervous system. Both the sympathetic nervous system and the lymphatic system play a significant rôle in the pathogenesis of these conditions and he believes the effect of iodine to be intimately related to the pathological physiology of the sympathetic nervous system.

In a study of the relation of climate to the etiology of exophthalmic goiter Mills (130) found that the distribution of deaths from this disease as well as from other metabolic disturbances, coincides with geographical areas exposed to greatest temperature variation and storm frequency. He believes the climatic drive forces a certain number of the population too near the limit of their metabolic possibilities so that less of an exciting force is necessary to bring on these metabolic disorders. Capelle (35) reviews the question of involvement of the thymus in the sympathetic complex of exophthalmic goiter. He believes such a relationship exists, but that removal of the thyroid with perhaps preliminary

irradiation of the thymus should be the primary therapeutic procedure. In cases which fail to respond to thyroidectomy, removal of the thymus may be considered. Bowers (12) also concluded that the great majority of patients with hyperthyroidism present evidences of constitutional abnormalities other than those related directly to the thyroid gland. The almost constant presence of lymphoid hyperplasia in the thyroid glands of patients with toxic goiter and the frequent association of hyperplasia of the thymus and other lymphoid structures appear to indicate that at least one manifestation of predisposition to hyperthyroidism is the presence of the thymico-lymphatic constitution to which Warthin has applied the name Grave's constitution.

Clinical manifestations The literature dealing with the clinical features of hyperthyroidism is concerned primarily with the atypical, the masked, and the borderline and iodine resistant types. Thompson (183) believes that the nervous manifestations of exophthalmic goiter are merely exaggerations of reactions which were previously present in a somewhat less intense form in patients with emotional instability. Thyroidectomy which reduces the basal rate to normal, only restores the patients to their former state. The degree of nervous disturbance during the disease depends largely upon the intensity of the emotional instability that was present before it developed. Comparing exophthalmic goiter as it occurs in Boston with that occurring in Chicago Thompson and Means (185) were unable to observe any significant differences in the 3 regions. Elliott (61) discussing the medical aspects of thyrotoxicosis, emphasized the necessity for accurate diagnosis in cases presenting symptoms identical with those of thyroid disease, but due to conditions of excessive nervous stress or to the presence of chronic infections also in the cases of thyrocardiacs, in whom manifestations of hyperthyroidism are overshadowed by the cardiovascular symptoms. As difficulties in diagnosis may be further increased if the patients are under partial iodine control, Elliott believes that iodine should be withheld until a positive diagnosis has been made and a plan of treatment adopted. Crises of hyperthyroidism may simulate severe general infections, encephalitis, heart failure, or acute abdominal conditions. The possibility of such crises must be kept in mind and their hyperthyroid background recognized. Troell (189) reports a series of cases of Basedow's disease with a basal metabolism of +20 or lower. Potter and Morris (153) found iodine resistance to occur particularly

in the severe forms of hyperthyroidism and to complicate the therapeutic problem greatly. Iodine resistance was found in 11 per cent of patients with diffuse exophthalmic goiter and in 3.6 per cent of patients with toxic adenomata. Of these, 40 per cent had had previous iodine, which probably accounted for their resistance. The remaining 60 per cent had had no iodine, except that which may have been present in the table salt. Twenty two per cent of the refractory patients with exophthalmic goiter and 10 per cent of those with hyperfunctioning adenoma exhibited severe postoperative reactions. Such patients require the most careful observation and judgment as to the type and extent of operation. In these conditions, multiple-stage operations are of value. Dunlap and Davis (56) point out that atypical manifestations of exophthalmic goiter are prone to appear early in the course of the disease, before either exophthalmos or thyroid enlargement. The symptoms of an associated disease may be aggravated by the development of hyperthyroidism and conceal the presence of thyroid disturbance. Elevation of the metabolic rate and response to iodine are significant in confirming the diagnosis of exophthalmic goiter. Menard (126) reports 3 cases of leukemia which simulated hyperthyroidism. Rose (167) and Hamilton and Beck (81) report cases of hypertension presenting the clinical picture of thyrotoxicosis, for which they were erroneously treated. Even the basal metabolism in these cases was elevated. It emphasizes the value of a therapeutic test with iodine. Wohl (202) describes a series of cases of thyrotoxicosis which suggested other conditions such as heart disease, spastic colitis, chronic appendicitis, and vasospastic disturbances. In the absence of the cardinal signs of exophthalmic goiter the secondary symptoms such as flushing tachycardia, tremor nervousness, and weight loss are important features leading to a proper diagnosis. Persistent elevation of the basal metabolism and response to Lugol's solution confirm the diagnosis. Similar atypical cases were described by Rankin and Haines (158) and Joscelyn (99) reported 3 cases with disease of the central nervous system simulating hyperthyroidism.

Osterberg and Mills (148) examined bone which had been removed from patients with histories of hyperthyroidism demonstrated chemically and roentgenologically. They failed to find osteoporosis, although it had been previously shown that bone rarefaction may occur because of increased calcium excretion in hyperthyroidism. Ask Upmark (11) describes tetany occurring pre-

operatively in the presence of thyrotoxicosis. He believes that the thyroid is concerned with mineral metabolism as this is indicated by the development of goiter following excessive calcium intake. Increased calcium excretion in hyperthyroidism may be a factor in the development of tetany during the course of thyrotoxicosis.

Morrison and Levy (133) and Mora (131) each describe a case of periodical paralysis associated with exophthalmic goiter. It is inferred that in some of these cases the endocrine elements may play an important etiological part and may respond to thyroidectomy. Myasthenia gravis occurring together with exophthalmic goiter has been reported from time to time. One such case is described by Cohen and Kling (43). They point out that myasthenia of greater or less degree is observed in most cases of exophthalmic goiter, and that some of the eye signs are merely evidences of weakness of the ocular muscles. They think a definite relation exists between myasthenia gravis and exophthalmic goiter. Hagedorn (79) reports the case of a patient with thyrotoxicosis and paralysis of the superior rectus muscle of the right eye. Syphilis and thyroid disease are discussed by Netherton (140) and Baumgartner and Weill (14) report exophthalmic goiter in which excised thyroid was found to contain tuberculosis.

Ipsen (92) reports a peripheral vascular dilatation in hyperthyroidism evidenced by measurements of the cutaneous temperature. Elevation of the skin temperature of the foot parallels the rise in the basal metabolism. Immediately after operation there is a further transitory increase in the temperature from the thyrotoxic effect exerted upon the arteries by way of the sympathetics. In myxoedema, thyroid administration elevates the skin temperature and in a case of Raynaud's disease relieved the arterial spasms. Kreck (102) found the amino acid excretion in the urine to parallel the basal metabolism in hyperthyroidism. Following iodine medication, the amino acid nitrogen fell and after thyroidectomy a further striking drop occurred. Gussel (73) studied the rôle of the liver in the disturbance of metabolism in patients with thyrotoxicosis. The blood-sugar curves following the administration of insulin and after the ingestion of levulose resembled those obtained in cases of severe liver disease. At autopsy, fatty peripheral degeneration and congestion of the liver were found. Such changes may persist for as long as a year after recovery from hyperthyroidism, but the liver glycogen returns to normal. Gussel therefore recommends preliminary treatment with a

liver-sparing diet and small doses of insulin and glycogen. Lichtman (115) studied liver function in hyperthyroidism by determining cinchophen oxidation. He found indications of moderate impairment of liver function but no instance of severe hepatic disturbance. The functional impairment did not parallel the severity or duration of the thyroid disease, but in some cases liver function tended to improve as the basal rate returned to normal. No further impairment of hepatic function was indicated by the galactose-tolerance test or by determinations of the icterus index, bilirubinemia, and bile-salt excretion. According to Lerman and Brogan (113) renal function is slightly lower in myxoedema than in exophthalmic goiter, but in both diseases it falls within the normal limits. The differences are adequately accounted for on the basis of circulatory conditions and offer no support to the concept that the permeability of renal tissue is significantly altered in hyperthyroidism or myxoedema.

Studies of the heart and circulation in toxic goiter reveal increased cardiac activity the result of acceleration of the pulse rate, an increase in the minute volume, and elevation of the pulse pressure. Cardiac hypertrophy may occur in long standing cases, and cardiac irregularities and symptoms of congestive heart failure may supervene if the added burden is excessive for a heart previously damaged by valvular or myocardial disease. No specific changes are found in the myocardium of patients dying of hyperthyroidism. Andrus and McEachern (10) show that the tachycardia and other cardiac symptoms are related to the direct effect of thyroxin on the myocardium. This, plus the burden of the increased circulatory demands of the entire organism, explains the cardiac manifestations of hyperthyroidism. In individuals whose circulatory reserve has been diminished by age or by organic cardiac disease myocardial failure may result. Yater (205) adds a general vascular relaxation brought about by the local action of metabolites on the arterioles and capillaries, an increase in the circulatory blood volume due mainly to a contraction of the spleen and an increased rate and depth of respiration as factors in the fortuitous adjustment of the circulation in hyperthyroidism. Rahm and Parade (156) were unable to establish a characteristic blood pressure type in Basedow's disease, but an increased pulse pressure was almost always demonstrable. The amplitude did not parallel the basal rate. Pemberton and Willis (150) also record an increased pulse pressure and increased circulatory rate in

toxic goiter. Cardiac hypertrophy was found at autopsy in 15 per cent of the cases, usually those in which the goitrous condition had been prolonged. No distinctive histopathological changes were noted. Menne, Keane, Henry, and Jones (127) found degenerative changes and fibrosis in the hearts of rabbits with experimental hyperthyroidism. They suggest that the changes might be produced by overexertion rather than by the toxic effect of thyroxin on the myocardium. Burnett and Durbin (34) suggest that the large numbers of patients who continue to show cardiac symptoms after thyroidectomy may have suffered some degree of permanent damage as a result of the toxemia associated with the goiter.

Hatchel (83) states that there are pronounced abnormalities of the carbohydrate metabolism in thyrotoxicosis which disappear after thyroidectomy and are not true diabetes. He does not believe the incidence of true diabetes to be increased in the presence of hyperthyroidism. Andrus (9) arrived at a similar conclusion. The disturbance in carbohydrate metabolism in hyperthyroidism consists of an abnormally rapid breakdown of glycogen. In diabetes, on the other hand, the ability to store carbohydrate is reduced. If hyperthyroidism is superimposed upon diabetes, abnormal demands are made upon an already inefficient carbohydrate metabolism by the augmentation of the basal metabolic rate and the increase of glycogenolysis. Andersen (6) by a special technique demonstrated spontaneous glycosuria in all of 15 patients with exophthalmic goiter. In these cases there was an augmented and protracted hyperglycemic curve following glucose ingestion. John (96) has analyzed the carbohydrate metabolism in patients with hyperthyroidism treated at the Cleveland Clinic. He states that the incidence of true diabetes in persons with this condition is twice that in normal individuals. Non-physiological hyperglycemia was found on one or more occasions in 620 (6.88 per cent) of the 9,000 cases. In about one third of these the hyperglycemia persisted and resembled that of diabetes. Following operation for hyperthyroidism the diabetes improved in 55 per cent, remained stationary in 15 per cent, and became worse in 30 per cent. Of the entire group of patients, 35 per cent were still taking insulin. John believes a "diabetic anlage" to be present in these patients, and that the hyperthyroidism, by elevating the metabolism and increasing the demands upon the insulinogenic system, predisposes to the development of diabetes. In some of these patients, in whom the disturbance of carbohydrate metabolism is slight, the diabetes

may be "functional," or the early stage of a true diabetes. Only observation over a long period of time will permit the differentiation between the two. The glycogen store in the liver is low in hyperthyroidism. Its reduction increases the tendency toward acidosis and suggests the advisability of pre-operative and postoperative intravenous administration of glucose with or without insulin.

Exophthalmic goiter in children has been the subject of reports by Dinamore (53) of the Cleveland Clinic and Rankin and Priestley (159) of Rochester. The former series comprises 57 cases, the latter 91. In the cases of children the clinical manifestations of hyperthyroidism are essentially the same as those in adults and the treatment follows the same general principles. Acute exacerbations of the disease are more prone to develop in children, and considerable care in the pre-operative preparation and surgical treatment is necessary. Surgery is the treatment of choice, and the end-results are good. Because of the greater need for thyroid secretion in the growing child somewhat more thyroid tissue must be left behind. Blood-iodine studies in a case of thyrotoxicosis in a boy of eight years reported by Curtis (47) indicated changes of the same character as those found in adults. A series of cases of thyrotoxicosis in Negroes is presented by Herrmann (84) who contradicts the frequently made statement that the disease is uncommon in this race. The clinical symptoms do not differ from those in white patients, and psychic shock, financial worries, and domestic difficulties seem to play as important a part in precipitating the syndrome.

Treatment. Evaluation of the relative merits and disadvantages of the various therapeutic attacks for toxic goiter over a period of time has permitted the reconciliation of many divergent opinions. Contradictory claims of the proponents of various types of treatment have given way to an almost universal acceptance of the places in the therapeutic scheme which are occupied by surgery, irradiation and medical treatment. Subtotal thyroidectomy in 1 or more stages, has emerged as the accepted treatment of choice for most cases of hyperthyroidism. Medical treatment has been assigned a dominant rôle in the preparation of patients for surgery and in the after-care of the patient handicapped by visceral damage. Although X-ray irradiation is advocated by a few as the treatment of choice for hyperthyroidism in general, it is usually considered indicated only in borderline cases, thyrotoxicosis which persists after operation, and occasionally the

preparation of poor surgical risks for operation. The results of surgical treatment and follow up studies in a number of large series of cases reveal that the end-result is usually very satisfactory, the mortality is low and serious postoperative sequelae are infrequent.

Medical treatment with iodine in organic combination in the form of di-iodotyrosine is recommended by Del Castillo and Dassen (51) and by Parhon and Ballif (149). They consider the action superior to that of iodine in other forms. Bram (24) points out the great tolerance in hyperthyroidism to quinine and recommends this drug in large doses as an adjuvant in the medical treatment of exophthalmic goiter together with regulation of the diet, psychotherapy and proper environment. Quinine may be used in combination with iodine. When recovery is attained, the singular tolerance to large doses of quinine disappears and the patient becomes normally susceptible to cinchonism. Sodium and ammonium fluorides were used to good advantage by Macchiaro (120) and Orlowski (147). Loeper, Soulié, and Biay (118) advocate the use of sodium borate in toxic goiter. They report a return of protein equilibrium and lowering of the basal metabolism with amelioration of the clinical symptoms. The intramuscular injection of animal blood is advocated by Bier (17). Orlowski (147) on the other hand, was unable to note any benefits from animal blood treatment other than those occasioned by the rest in bed. Transfusion with human blood from normal and hypothyroid subjects is favorably reported upon by Biancalana (16). He believes the method of value in the pre-operative preparation of patients. Ergotamine was used with good results by Ewen (64) in a case of hyperthyroidism associated with psychosis. Anderson (7) discusses the value of quimidine in the treatment of cardiac irregularities due to hyperthyroidism. The drug is used in cases in which fibrillation persists more than three days after operation. Failure of response or recurrence of the irregularity indicates persistent hyperthyroidism. After adequate thyroidectomy the addition of quimidine therapy will restore normal rhythm in 96 per cent of cases of persisting fibrillation. A review of the end-results of medical treatment for toxic goiter was obtained by means of questionnaires addressed to their patients by Eason and Wallace (57). Their impression was that the late results were favorable and the mortality was low. They were unable to see any striking advantages of one form of non-operative treatment over any other and assume that the course of the disease

is self limited tending to arrest itself in time. Engel (62), however, in a similar questionnaire follow up of cases treated by all methods found far the highest mortality among those treated medically. The percentage of cures did not exceed those from X ray or surgical treatment and the duration of treatment was longer. Satisfactory results were obtained in younger patients with milder forms of thyroid intoxication. Engel concludes that medical treatment should be limited to cases of this type.

X ray treatment is recommended by Williams (199), Menville (118), Quigley (155), Pfahler (151), Read (161), Labbé and Asérad (105) and Gail (70). Menville received 75 replies from 200 questionnaires sent to radiologists. He tabulates the results of treatment by radiation in 10,341 cases, and reports a cure in 66 per cent, improvement in 21 per cent, failures in 12½ per cent and recurrences in 8½ per cent. These figures coincide approximately with those reported by others mentioned. There is still a striking lack of accurately controlled and followed series of cases with studies of the basal rate such as are available regarding surgical treatment. Until such controlled reports are available the true value of X ray therapy will be difficult to determine. That X ray treatment is not without danger is evidenced by the report of Schröde (168) of a fatal thyroid crisis following X ray exposure.

The pre-operative preparation of patients with toxic goiter by means of iodine has found almost universal acceptance in the international literature. This agent, together with the usual rest and dietary and symptomatic medicinal treatment, is used routinely wherever thyroid surgery is done. In a study of the range of effective iodine dosage, Thompson, Thompson, and Cohen (187) found the daily administration of 0.75 mgm. to constitute the usual minimal effective dose. They state that the mortality from thyroid surgery has been reduced in the leading clinics from 1 to 4 per cent to from 0.25 to 0.7 per cent since the introduction of iodine. In refractory cases, they advise waiting approximately four weeks and then repeating the iodine administration. Koenig (101) states that from 70 to 80 per cent of all patients with toxic goiter admitted to the Leipzig Clinic had been previously treated with iodine. Refractoriness to iodine was observed in 38 per cent of the cases, among which several fatalities occurred. Winkenwerder and McEachern (200) found iodine remission to occur in 144 of 157 cases studied with an average drop in basal rate of 50 per cent during an average period of thirteen and one half days. The remis-

sion was transitory, a recurrence usually developing whether iodine was continued or not. Winkler and McEachern urge that iodine be given only as a pre-operative measure. No difference in response was seen in diffuse as compared with nodular goiter, and the effect was independent of the preparation or solution of iodine used. Links (11) advises the blowing of oxygen against the mucous membranes of the gums as a means of increasing the oxygen tension in the blood. This procedure is said to ameliorate the symptoms and to lower the metabolic rate. Smirnov (17) claims that European statistics reveal a mortality rate of from 5 to 6 per cent, except in Oppel's clinic, where the rate formerly was 9.3 per cent and, since the introduction of pre-operative blood transfusion, has dropped to 2.2 per cent.

Little has been added to the operative technique of thyroidectomy. The operation is apparently standardized, with only minor differences as performed by different operators. Avertin is finding considerable use as a pre-anesthetic (Neill, 120) in conjunction with local anesthetics and nitrous oxide. There is still a difference of opinion as to the wisdom of 1 stage as contrasted with multistage operations. Richter (164, 165) advocates the 1-stage attack as the routine treatment, and his low mortality rate (0.89 per cent) justifies his assertions. Most surgeons, however, employ the 2-stage procedure in certain selected cases. Jackson (93) uses it in cases of iodine-fast goiter. In the Laker Clinic, multiple-stage operations are still done in 30 per cent of the cases. Laker believes that, particularly in the "apathetic type" of hyperthyroidism, multiple-stage operations are indicated. Roeder (166) has noted a relatively high incidence of voice changes following thyroidectomy in cases in which there was definitely no injury to the recurrent laryngeal nerves. On the basis of a study of the innervation of the larynx, he points out the proximity of the branches of the superior laryngeal nerve to the upper pole of the thyroid. When the superior pole is high, this nerve may be injured, with the production of various sensory and motor disturbances. Roeder describes a technique for the avoidance of nerve injury and other damage during operations on the superior pole of the gland.

Modern surgery with adequate pre-operative preparation and the use of local and nitrous oxide anesthesia, is essentially safe, as the consistently low mortality rates, particularly in the larger series of cases, indicate. The results of treatment are eminently satisfactory; the late results, when checked by an accurate follow-up

are good, and the incidence of serious complications is low. Proper selection of the time for operation is an important factor in the reduction of the mortality rates. Seed (175) establishes certain criteria of operability based on the weight curve, muscular strength, metabolic rate, and general condition of the patient. Richter (164, 165) as stated, reports 1,335 consecutive cases of thyrotoxicosis with a case mortality of 0.89 per cent. He has personally followed 1,096 of the patients with repeated determinations of the basal metabolic rate. Of this series, 96 per cent were completely relieved of their intoxication, as evidenced by a normal metabolic rate. Of the remaining 39 patients, 23 consented to re-operation and 21 of these were cured. Ultimate success was therefore obtained in 95.4 per cent of the cases. The so-called relapse, or recurrence, Richter considers practically always due to residual hyperthyroidism from failure to remove an adequate amount of the gland. Bremner (38) reports 283 thyroidectomies with 17 deaths. Seventeen of the patients continued to be hyperthyroid and were re-operated upon, with ultimate relief in all but 1. In a number of the cases transitory hypothyroidism was manifested, but persisted in only 1. One fatal tetany 3 mild ones, and 4 unilateral laryngeal nerve paralyses were observed. Clute and Veal (42) carefully studied the end-results in a series of patients who had been operated upon over five years previously. Of the 97 patients in the series, 81 were completely and satisfactorily cured, 7 manifested slight toxicity which was entirely controlled by the continued use of iodine, 3 developed myxedema which was entirely controlled by thyroid extract, 4 were still toxic, but were able to work. One patient died following a recent operation for recurrent hyperthyroidism. Clute and Veal conclude that 92 (94.8 per cent) of the patients are cured by adequate surgical therapy. Noehren (142) reports a similar series examined after two years, 94.75 per cent of whom showed completely satisfactory results. Allowing for those he was unable to follow, he estimates the incidence of permanent cure at 90 per cent and the mortality at 1 per cent. Of 12,690 patients whose cases are reviewed by Crile (46) 97 per cent were in good or fair condition one or more years after operation, 3.03 per cent had persistent hyperthyroidism, 2.7 per cent had hypothyroidism, 1 per cent had tetany and 2 per cent had recurrent laryngeal nerve paralysis.

Complications and sequelae following thyroidectomy. Under the title "Postoperative Grave's Disease," Bram (23) discusses the cases of 563

patients with hyperthyroidism who had undergone 1 or more thyroidectomies. These constituted 13 per cent of his total material. Bram differentiates several forms of postoperative Grave's disease, including persistence of the original syndrome without an intervening period of apparent normality; recurrence of the symptoms after an interval of normality; the existence, in combination, of so-called hypothyroidism and hyperthyroidism, with or without a brief period of apparent well-being immediately following thyroidectomy, and persistence or recurrence of Grave's symptoms with a complicating acromegaly or psychosis. He infers from his observations that Grave's disease is not the same as hyperthyroidism and is not primarily a disease of the thyroid. He therefore objects to routine thyroidectomy in the treatment of the condition. The acute thyroid crisis is discussed by Greene and Greene (77). Although this complication usually follows thyroidectomy, it may occur after psychic traumas or with intercurrent infections. Greene and Greene report fatal cases following tonsillectomy and the injection of varicose veins in patients with hyperthyroidism. Early recognition and therapy consisting of the administration of iodine, fluids glucose and morphine are demanded. After recovery from such a crisis, an adequate period should elapse before surgical intervention is undertaken. Fatal air embolism following substernal thyroidectomy is reported by Urban (193) and fatal pulmonary embolism arising from thrombosis of the left hypogastric and iliac veins following thyroidectomy for an apparently toxic nodular goiter is reported by Lieblein (116). The latter is of interest in view of the proverbial infrequency of embolism following thyroidectomy and the postoperative use of thyroid as prophylaxis for embolism. Boshamer (21) asserts that thyroxin offsets the vagotomic effects of abdominal operations and thereby is effective in reducing the tendency toward thrombosis and embolism.

Discussing injuries of the recurrent laryngeal nerve, Lahey (106) states that the adductor fibers are more resistant than the abductor fibers. If bilateral complete division occurs the cords first assume a cadaveric position permitting adequate respiration, but preventing normal phonation. Later as the result of fibrosis and contraction, the cords approximate one another, with restoration of the voice, but with dyspnea on exertion. Respiratory obstructions occurring during or immediately after operation are usually due to angulation or pressure on the trachea. Submucous resection of the cords has been found

of value in old long-standing cases of bilateral abductor paralysis, permitting removal of the tracheotomy tube. Froeschels (69) reports good results from training patients with unilateral paralysis of the recurrent nerve to limit the amount of air expired while speaking. By this means they are able, within a short time to learn to speak in a pleasant voice.

The parathyroid glands, according to Collip (44), regulate the calcium metabolism by acting upon the connective tissue elements of the bones. For the treatment of parathyroid tetany, Schultzer (174) recommends injections of parathyroid extract together with calcium chloride and Vitamin D by mouth. When the blood calcium reaches the normal level he stops the hormone injections and continues treatment with calcium and Vitamin D. O'Brien (144) collected 42 cases of cataract complicating postoperative tetany, and adds 3 of his own. The cause of the cataracts is unknown. The condition is frequently bilateral and may progress in spite of treatment which controls all other manifestations of tetany. The lens changes are not specific. Operation is the only known treatment.

Naffziger (136) reports 6 cases in which exophthalmos progressed after surgical relief of hyperthyroidism, with serious damage to the eyes and impairment of vision. Operation, consisting of intracranial removal of the orbital plate and the roof of the optic foramen, was done without mortality and with striking recession of the exophthalmos and improvement in vision. The ocular muscles were found to be enormously increased in size. Specimens of these muscles removed at operation were found to be pale, edematous, and fibrotic. The increased bulk of the retrobulbar tissues due to the myositis is considered to be the cause of the exophthalmos. Friedenwald (66) examined the orbital tissues in a series of 6 cases of exophthalmic goiter that came to autopsy. In 1 of them in which no operation had been done, changes in the ocular muscles similar to those described by Naffziger, were found. The orbital trouble had apparently preceded the hyperthyroidism in this case by several months. Friedenwald believes that the orbital myositis is a separate disease entity and not part of the ordinary picture of hyperthyroidism. A case of arteriovenous aneurism of the thyroid vessels following thyroidectomy is reported by Selman and Freedlander (176).

HYPOTHYROIDISM

Recognition of the relation of hypothyroid states to clinical syndromes and dysfunctions of

various organs finds expression in numerous reports from many fields of medicine. From the field of otolaryngology Bryant (33) records relief following the administration of thyroid in cases of persistent eczema and furunculosis of the auditory canal, tinnitus, tubal catarrh, and otosclerosis, as well as nasal obstructions, inflammations, hoarseness, migraine, and trigeminal neuralgia. Relief of keratoderma of the palms or the soles in hypothyroidism, by the administration of thyroid is reported by Mizuno-Fourmer (134). Gynecological disturbances, chiefly menorrhagia, may be due to hitherto unrecognized hypothyroidism and may occur even in the presence of a normal metabolism according to Waters and Williams (107). Breckinridge (35) attributes cases of amenorrhea, abortion, premature labor and death of the fetus to lack of thyroid. Two cases of "myxedema heart" are reported by Ayman, Rosenblum, and Falcon-Lesca (12). Enlargement of the heart with return to normal following thyroid treatment is considered a diagnostic feature of this condition. Abdominal pain suggesting surgical disease may also be due to hypothyroidism, according to Hinton (86). Ascites on a hypothyroid basis is described by Evans (63) and Beretervide and Herrera (15). Stoll (181) describes personality changes due to myxedema which may even lead to commitment to an institution for the treatment of mental disease. Cattell and Ramsey (37) report delayed ossification in hypothyroidism during the growing period. Stokes (180) emphasizes the value of blood-cholesterol determinations in the diagnosis and treatment of myxedema. He finds the cholesterol increased from the normal (160 to 200 mgm. per cent) to values ranging from 311 to 1,000 mgm. per cent. Under thyroid therapy these values fall to within normal limits. Youmans and Riven (106) believe that the clinical picture of hypothyroidism without myxedema is more common than is generally appreciated. The absence of definite signs and symptoms of myxedema and the vagueness of the symptoms account for the difficulties in diagnosis. Of great diagnostic importance are the basal metabolic rate and the response to thyroid therapy.

ANOMALIES, INFLAMMATIONS, TUMORS

Aberrant thyroid tissue. Moritz and Bayless (133) report 6 cases of lateral cervical tumors arising in aberrant thyroid tissue. These tumors were truly aberrant as they were not connected with the thyroid gland. Some were multiple, others single. Benign, malignant and combined benign and malignant growths were included in

the 6 cases. The benign as well as the malignant tumors were frequently papilliferous. Other cases are reported by Vidgoff (195) Eberts (58) and Cooke (45).

Ulrich (192) states that in most of the reported cases of lingual goiter in which extirpation has been done the operation resulted in myxedema. The reason for this is that downward development of the gland usually ceases when it is arrested at the base of the tongue. The mere presence of a lingual thyroid does not indicate its removal. Surgery is justified only if symptoms are being caused. Ulrich advises preliminary tracheotomy in such cases and exploration of the thyroid region to determine the presence or absence of a normally situated gland. If excision is done, thyroid therapy should be immediately instituted. In addition to Ulrich's cases, others are reported by Ziegelman (208) Grace and Weeks (76) and Bisi (19). Ovarian struma is described by Witherspoon (201) and Blackwood (121). In both cases the thyroid tissue was part of a teratomatous cyst.

Inflammations of the thyroid gland. The subject of thyroiditis is reviewed by Clute and Labey (41). They divide the inflammations into simple, suppurative, and chronic forms, each of which may appear primarily in the thyroid gland or may be secondary to a general infection. As a rule inflammation of the tonsils, teeth, or upper respiratory tract precedes the thyroid involvement. Chronic thyroiditis includes non-specific inflammation which may follow an acute thyroiditis or may be secondary to inflammations elsewhere. This form may be accompanied by hyperplasia and symptoms of hyperthyroidism. The specific forms include Riedel's struma, tuberculous thyroiditis, and syphilis of the thyroid gland. A case of gonococcal thyroiditis with abscess formation is reported by Alexander-Derica and Jonesco (5). Tuberculous of the thyroid producing clinical manifestations is rare. Rankin and Graham (157) report that in the microscopical examination of 20,758 glands removed surgically at the Mayo Clinic over a period of eleven years, tuberculosis was diagnosed in 21 (approximately 0.1 per cent). In only 3 recorded cases has the diagnosis been made pre-operatively. Hyperthyroidism with a basal metabolism of +19 or higher was noted in 15 of the Mayo Clinic cases. Rankin and Graham were unable to determine whether hyperplasia of the gland predisposed to tuberculosis or was secondary to it. Convalescence after thyroidectomy was the same as in uncomplicated cases, and the prognosis is considered as good.

Tumors That the ordinary nodules of the thyroid gland which were formerly considered adenomata should be removed from the category of neoplasms is generally conceded. Whether there are true adenomata of the thyroid gland as distinct from this category is still an open question. Lahey (110) believes that fetal adenomata occur, and usually as single, discrete, encapsulated nodules. He states that almost all malignancies of the thyroid in his cases have arisen in such nodules. Since these nodules are benign for a time and since it is impossible to predict when malignant degeneration will ensue, he believes that removal of such nodules should be done as a prophylactic measure. Three cases of carcinoma of the thyroid in children from the same clinic are reported by Cattell (36).

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ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Adelstein, L. J., and Courville, C. B.: Traumatic Osteomyelitis of the Cranial Vault, with Particular Reference to Pathogenesis and Treatment. *Arch Surg* 933, xlv, 539

Secondary osteomyelitis of the cranial vault following injuries to the head is not very common. Its infrequency is due to the improved treatment of scalp injuries by the removal of foreign bodies which contaminate the wound, the excision of destroyed tissue and the use of antiseptics. The organisms causing the condition enter the bone in several ways. In local bruises with or without open wounds they are presumably introduced by the traumatic agent or from infected hair follicles. In closed wounds they may sometimes be blood borne. In open wounds they may be introduced into the bone when the outer layer is ground off by scraping or glancing injuries which are often accompanied by irregular tearing or avulsion of the overlying scalp. In cases of compound comminuted fracture of the skull frank infection may develop either immediately or after an interval of latency. In some cases the bacteria are introduced secondarily by extension of skin infections such as furuncles or boils.

On the basis of its characteristic appearance in the roentgenogram, traumatic osteomyelitis of the skull may be classified as follows:

1. Localized osteomyelitis following an open wound of the scalp, a local injury which has left the scalp intact, or the direct implantation of infection into the diploe by abrasion of the outer table.

2. Spreading osteomyelitis following invasion of the diploe venous channels from a fracture line or operative defect.

3. Infectious necrosis of fragments in a comminuted skull fracture due to direct or indirect infection of the fragments from a contaminated overlying wound or a secondarily infected operative wound.

As is characteristic of localized osteitis of the skull, extradural abscess is the most common intracranial complication. The accumulation of pus is the result of a downward spread of the infection through the inner table. Local dural hyperemia is followed by the formation of granulation tissue and the exudation of pus. In most instances an extradural abscess is evacuated spontaneously by dissolution of the overlying bone, but occasionally trephination and drainage are necessary. These procedures are indicated when evidences of sepsis and localizing neurological signs make their appearance in a recog-

nized case of osteomyelitis. The authors cite examples of infection of this type and point out that because of the peculiar anatomy of the flat bones of the skull, the arrangement of the blood supply, the diploe and the closed venous system, radical procedures have no place in the treatment of the condition. The treatment indicated is the opposite of the treatment indicated for acute osteomyelitis of the long bones.

The prevention of osteomyelitis of the skull depends mainly on careful handling and thorough débridement of wounds of the head causing compound fractures with indriven fragments of bone and debris from the street. It is necessary to remove all fragments of comminuted bone, hair and other extraneous material, which in such cases always mean potential infection. A thorough débridement of irregular margins of wounds after the removal of foreign material will often allow healing by primary intention. In the course of exploration for undriven fractures it has been the practice also to iodinize thoroughly and repeatedly all wounds extending through the galea. The acute case may present an infected appearing wound of the scalp with irregular edges which drains variable amounts of foul-smelling pus. The type of involvement of the bone is suggested by the history of the case and can be determined definitely by roentgen examination. The local treatment consists of daily dressings with careful cleansing of the wound and the application of balsam of Peru. Balsam of Peru is slightly antiseptic, keeps the wound moist, and favors the formation of healthy granulation tissue. Exuberant granulations that threaten to close draining sinuses should be cauterized with a silver nitrate stick.

The process of sequestration is often slow and should be checked roentgenologically every three or four weeks. The time of separation of the infected fragments depends upon the virulence of the infection and the type of the lesion. In some cases the sequestrum is discharged spontaneously and is found at the time of the daily dressing. If the sequestrum is large enlargement of the opening of the discharging sinus may be sufficient to permit the passage of the bony fragments. As a rule healing does not take place until all large sequestra have been discharged or removed, but in two of the authors' cases of osteomyelitis of fragments in comminuted fractures it occurred when small fragments were still present. Occasionally surgical removal of well formed sequestra is justified to shorten the course of the infection. At no time is it warranted or necessary to smooth the surrounding edges of the defect.

in the skull, as this procedure tends only to open widely the diploic spaces and permit the spread of the infection. Under ordinary circumstances the most rational type of surgical treatment for traumatic osteomyelitis of the skull is simple removal of completely detached sequestra. The occurrence of an extradural abscess that does not drain and the formation of a secondary subdural abscess necessitate exploration and drainage preferably at the site of the original bony necrosis. In some cases it may be necessary to enlarge the opening made by the burr as an extradural abscess may not be located immediately beneath the area of focal necrosis.

It is of importance to build up and maintain the patient's resistance as this type of infection usually runs a course of months. In the cases of patients in poor condition and in those of children such measures as exposure of the body to ultraviolet light or the sun and the administration of cod liver oil are employed. Such patients should be ambulatory and out of doors as much as possible. If no complications arise, they may be treated in the office and, with suitable protection, may carry on their occupations.

MARKET P. LICHTENSTEIN, M.D.

Chen, H. I. and Loucks, H. H.: Composite Tumors of the Salivary Glands. A Clinicopathological Study of Forty Five Cases. *Chinese M J* 1933 xlvii, 138.

The authors discuss simple mixed tumors and those with malignant changes, but not tumors which were primarily malignant. Twenty-eight of those reviewed were in the parotid region, nine were in the submaxillary region and eight were in the palate.

Mixed tumors contain elements simulating tissues of both epiblastic and mesoblastic origin. Several theories regarding the origin of these tumors are reviewed. According to the theory most widely accepted, they are of ectodermal origin. Embryonic rests or inclusions of mesenchyme derived from ectoderm may account for all of the various tissues found. Ewing agrees that the tumors do not arise from endothelial tissue, and concludes that no one source has been definitely established. These of the adenomatous type probably develop from the acini and ducts of the gland. The basal-cell and adenoid cystic endotheliomas are encapsulated or extraglandular arising from misplaced or embryonal tissue or from branchial remnants. Mucous tissue and cartilage may be derived from epithelium and do not need to be included among the tissues of origin.

Various factors have been suggested as predisposing to the development of mixed tumors, but in only three of the authors' cases was there a history of association with other factors. In one of the latter there was a history of trauma in another a history of abscess and in a third a history of severe toothache.

Mixed tumors are usually encapsulated. They may lie on the surface of the gland or may be em-

bedded in it. They may be connected with the gland by a pedicle or may be found at some distance away from it and with no apparent connection to it. They are associated with the parotid, submaxillary, and palatal glands in the ratio of 6 : 2 : 1. Occasionally they occur in the lips, nares, and eyelids. They are not found in the tongue or the sublingual glands. They are often lobulated, and may present both hard and soft areas. Because of the heterogeneous composition revealed in the cut section the diagnosis can usually be made from the gross specimen. The tumor may be composed entirely of a clear homogeneous mucinous material separated by thin septa, or may be cellular throughout and pale gray. Varying amounts of cartilage may be present.

On microscopic examination the parenchymal epithelial cells show two general types of arrangement either forming glandular or cystic structures or appearing in irregular masses, strands, or anastomosing columns. The cells of the glands or cysts are usually small and cuboidal whereas those of the solid cords or strands are cuboidal polygonal, or rarely spindle-shaped. There may be masses of typical squamous cells with characteristic intercellular bridges and keratin pearls. The stroma consists usually of fibrous or mucinous tissue or cartilage, less frequently fat and bone are found. The fibrous tissue may be dense or loose. It may have become hyalinized and have a deeply acidophilic stain or the fibers may be loosely arranged and the intercellular spaces filled with a pale blue homogeneous substance presenting the appearance of mucinous tissue. When the intercellular substance is increased in density the appearance is that of a cartilaginous matrix. An intermediate stage has been named pseudo-cartilaginous tissue. Morphologically the epithelial and stroma cells are closely related and a complete series of transitional forms between epithelial cells and mesoblastic cells may be seen.

Forty-one of the neoplasms reviewed by the authors were typical mixed tumors varying mainly in the amount and type of the different tissues. Four of them were very cellular and showed pre-dominant epithelial tissue and a scanty fibrous stroma. The epithelial cells varied in size, shape, and staining qualities and showed numerous mitoses. These tumors proved to be malignant.

Mixed tumors may occur at any age but are most frequent in the third and fourth decades of life. They occur with equal frequency in both sexes and on both sides of the body. In the cases reviewed the shortest duration of the neoplasm before operation was six months the longest thirty-seven years and the average eleven and a half years. The longest reported duration in other series of cases was forty-eight years. The longer average duration in the cases reviewed by the authors was in agreement with the advanced age at which most conditions receive treatment in China. As a rule there is a history of slow growth of the tumor for years with a period of more rapid growth just before the patient

sought treatment. A history of recent rapid growth may indicate malignant change in a previously benign tumor. The size attained by the neoplasm varies from that of a walnut to that of an adult's head.

Tumors of the palate cause early symptoms. Most of them are of firm consistency. Many contain both hard and soft areas. Some are cystic or of an elastic consistency. The surface of the growth may be smooth, lobulated, or nodular. As a rule the tumor is freely movable. Fixation indicates the development of invasive powers and suggests malignancy. Regional and remote metastases are rare. Local glandular involvement occurs late even after malignancy develops. Erosion of the mandible by a submaxillary tumor was found in one of the cases reviewed, and erosion of the hard palate in two cases of palatal growths. Ulceration occurred in five cases, and healed ulcers were found in three. In every instance ulceration followed needling or the application of native medicinal plasters.

In 40 per cent of the cases pain developed late in the course of the condition. As a rule it was an occasional symptom, and in many cases it occurred only after manipulation, incision, or the development of ulceration and infection following the application of a plaster. In two cases the seventh cranial nerve was paralyzed. In one case the paralysis of this nerve was due to a previous operation and in the other was associated with paralysis of the fifth cranial nerve due to malignancy. Loss of weight, interference with chewing, swallowing, or talking, a decrease of the flow of saliva and nasal obstruction occurred in from one to six cases of the series. The general condition was usually good. Anemia was insignificant.

The treatment of choice is early complete removal. Late or incomplete removal is often followed by a malignant recurrence. Mixed tumors are usually well encapsulated and can be excised under local anesthesia. Radical operation is difficult, particularly in the parotid region where a part or all of the gland must be removed. Stenson's duct and the branches of the facial nerve must be protected. Previous ligation of the external carotid artery makes the operation easier and safer by controlling the bleeding which would be excessive without it.

The authors disagree with Kammeter who advised enucleation of slowly growing tumors of the parotid and submaxillary glands. They believe this to be unsafe even in the early stages because the epithelial cells are concentrated at the periphery where they may adhere to or penetrate, the capsule and therefore may be left behind. Gentle handling to prevent rupture and spilling of the contents is important. Branches of the seventh nerve should be sacrificed if they are incorporated in the tumor. In two of the cases reviewed, temporary paralysis lasting for a few months followed stretching of the nerve during operation. Bloodgood states that

irradiation offers palliation and controls the growth. The authors' experience with irradiation has been too limited for them to express an opinion regarding it.

The prognosis of mixed tumors of the salivary glands is excellent when radical excision is done at the primary operation. The dangers arise from (1) traumatization, (2) delay of treatment until malignant changes has occurred, and (3) incomplete operation.

Of the patients whose cases are reviewed, twenty are well, three have a recurrence, and twenty-two cannot be traced. Of the twenty who are well, eleven were operated upon more than a year ago. Nine (45 per cent) of the tumors showed malignant changes on microscopic examination.

E. S. PLATT, M.D.

ERY

Fuchs, A.: Concerning Unusual Ulcers of the Cornea and Their Treatment. *Brit. J. Ophth.* 1933, xviii, 193.

Following a brief description of two common types of corneal ulcer—herpetic and marginal infiltrates due to a cune romacea—the author reports cases of keratomycosis fascicularis, marantic ulcer, dendritic keratitis, dendritic keratitis with second ary infection or "wild geworden herpes," and serpiginous ulcers.

Beginning serpent ulcers are cauterized with the electric cautery if a considerable part of the pupillary area is clear. If the pupil is covered by ulcerated cornea, the base of the ulcer is trephined directly over the pupil and within the advancing border of the ulcer if possible. The trephine opening is 2 mm. in diameter and is placed so that no anterior synechia will occur. In making the trephine opening great care must be used to avoid injury to the lens, since Descemet's membrane is separated from the corneal stroma, the anterior chamber contains a hypopyon, and one may perforate the cornea without having any aqueous gush forth. Injury to the lens is avoided by opening the inner corneal layers with a Graefe knife held parallel with the plane of the iris. After the eye has become quiet an optical iridectomy is done at the most advantageous site.

Fuchs has found this method of treatment superior to any other since progression of the ulcer is stopped at once unless it is due to an overwhelming infection which nothing will stop. The resulting scar is smaller than the scars following canterization.

SAMUEL A. DUNE, M.D.

EAR

Drum, J. G.: The Role Which the Epidermal Flaps in Suppurations of the Middle Ear. *Arch. Otolaryngol.* 1933, xviii, 444.

Following a review of the literature on the rôle of the epidermis of the tympanic membrane in suppurations of the tympanum and mastoid, the

author reports a study of serial sections of 120 temporal bones. He states that not infrequently it is found that the epidermis has grown onto the inner aspect of the tympanic membrane. This struggle between the mucosa and epidermis is often the cause of suppuration even in the absence of bone disease or an open eustachian tube. In 3 of the author's cases there was an invagination of epidermis in Shrapnell's membrane.

In conclusion Druss discusses the various theories regarding the cause of primary cholesteatoma and the variety of therapeutic measures advocated for chronic suppurations of the middle ear.

GEORGE R. McAULIFF, M.D.

NOSE AND SINUSES

Bernheimer, L. B. and Cutler, M. The Effects of Radiation on Allergic Nasal Mucosa. A Further Report. *Arch Otolaryngol*, 1933, xvii, 658.

Of forty cases of vasomotor rhinitis treated by irradiation, satisfactory clinical results were obtained in a large percentage. The results have remained constant for a period of one year.

The method of irradiation described is safe; no untoward results having been observed in any of the cases in which it was used.

The authors are now investigating the clinical and histological effects of irradiation in cases of hay fever.

JAMES C. BRADFILL, M.D.

Fenton, R. A. and Larsell, O.: An Experimental and Clinical Study of the Histiocytes in Acute and Chronic Inflammation of the Accessory Sinuses. *Laryngoscope*, 1933, xliii, 933.

In an attempt to determine the rôle of the histiocytes in inflammation of the nasal accessory sinuses the authors carried out experiments on the mucous membrane of the cat and human mucous membrane. In the experiments on cats, injection of the frontal sinus with a large variety of substances was followed by a subcutaneous injection of 1 per cent trypan blue and fixation of the inflamed mucosa after two or three days. The experiments on human mucous membrane were made in selected cases of inflammation of the maxillary sinus in which the involvement appeared both clinically and roentgenologically to be equal. The two sides were treated differently and after a lapse of time the membranes were removed by radical operation and studied histologically.

Among the substances used were castile soap jelly, a thin glucose solution, a 50 per cent emulsion of coconut oil, jelly of chondrus crispus, milk of magnesia, 5 per cent calcium hydroxide, 1 per cent calcium lactate, 1 per cent sodium phosphate, and 2 per cent dichloramin T.

The findings indicated that the local use of solutions or suspensions of alkaline earth salts or hydroxides favors the mobilization of histiocytes. Oily and colloidal substances destroy the epithelium and favor infection by impairing ciliary action, thereby

leading to invasion of the subepithelial stroma by polymorphonuclear cells without an increase in histiocytes. The chlorides seem to favor edematous changes with a marked increase in lymphocytes.

JOHN F. DUFFY, M.D.

MOUTH

Duffy, J. J. Conservative Procedure in the Care of Cervical Lymph Nodes in Intra Oral Carcinoma. *Am. J. Roentgenol.*, 1933, xxix, 241.

Attention is called to the correction of a typographical error which occurred in the abstract of this article appearing on page 6 of the July 1933 issue of the INTERNATIONAL ABSTRACT OF SURGERY. The first sentence of the fifth paragraph should read: "In cases with operable metastases in the lymph glands, complete removal of the contents of both the anterior and the posterior triangles of the neck, together with the sternomastoid muscle and internal jugular vein, is done."

Veredinskij, A. The Treatment of Tumors of the Soft and Hard Palates (Ueber Behandlung der Geschwulste des harten und weichen Gaumens). *Nos. chir. Arch.*, 1933, xxv, 161.

The author discusses the treatment of tumors of the hard and soft palates and the uvula on the basis of twenty five cases of such neoplasms—twenty carcinomas, four epitheliomas (mixed tumors) and one melanoma.

In cases of well circumscribed and freely movable carcinomas of the soft palate and uvula, electroexcision and radium puncture give equally good results. Radium treatment has the advantage of leaving a better functioning soft palate. When the tumor is not limited to the uvula, electroexcision may influence phonation unfavorably.

For leucoplakia, hyperkeratosis, and the so-called precancerous involvement of the gums, electrocoagulation or the application of radium by means of a celluloid prosthesis is recommended.

In cases of unconfined cancers of the soft palate, which sometimes spread to the pharynx or tonsils, a preventive irradiation with the X rays followed by the intra-oral application of radium is indicated. For cases of cornified cancer of the gums involving neighboring organs the author recommends the external application of radium followed by electroexcision and the internal application of radium. When a sufficient amount of normal tissue remains, radium puncture may be used instead of electroexcision if the condition is only moderately advanced.

Cases of cancer of the gums with involvement of the cervical glands must be treated individually according to the extent of the cervical metastases. After roentgen irradiation a radical operation according to Crile's technique may be done. In cancer of the gums with considerable enlargement of the cervical glands the prognosis is poor but in moderately advanced cases which have not been neglected and are properly treated it is good.

The so-called mixed tumors, which in reality are epitheliomata, are treated best by operation.

Localized melanomata of the gums may be removed by electro-excision.

The author's results were as follows. Of eighteen patients with cancer of the gums, eleven are clinically well and seven are dead. One of the latter died of pneumonia two years and three months after the treatment, without a local recurrence. In the cured cases the cure has lasted for four years, three and a half years, and six months in one case each, for two and a half years in two cases each, and for two years and for one year in three cases each.

G. ALIPOV (Z)

NECK

Hanford, J M: Surgical Excision of Tuberculous Lymph Nodes of the Neck. A Report on 131 Patients with Follow-up Results. *Surg Clin North Am* 1933 xii, 302

This is a report on 131 patients with tuberculosis of the neck who were treated by excision in the past nine years. The success of surgical removal depends on early diagnosis. The more common diseases with which early tuberculosis of the cervical nodes may be confused are low-grade adenitis, simple hyperplasia of the glands, simple chronic adenitis, sebaceous cyst, Hodgkin's disease, lymphosarcoma, and bronchial cyst.

The chief characteristics of early tuberculosis of the cervical lymph nodes are

1. Nodes enlarged to from 2.5 to 3 cm. in diameter or a mass of 3 cm. or more persisting for longer than from six to eight weeks and associated with slight or no evidence of acute inflammation.
2. Slight fluctuation if liquefaction has begun.
3. A slight but definite constitutional reaction characterized usually by anemia, loss of energy, failure to gain weight, and loss of appetite.
4. Roentgen-ray evidence of calcification in the neck.
5. Microscopic evidence of tuberculosis in the removed tonsils.
6. Sterility of cultures of aspirated "pus" from a fluctuating part which are made on ordinary media for pyogenic cocci.
7. Positive biopsy findings. As a rule biopsy should be a radical complete excision.

Syphilis rarely if ever causes local enlargement of nodes likely to be mistaken for tuberculous nodes. A positive Wassermann reaction does not rule out tuberculosis.

The pathological changes are dependent mainly on 3 processes: cellular infiltration, necrosis, and fibrosis. These processes may be present in various combinations. In addition, there is the process incident to secondary infection, and the process of cicatrix formation.

Clinically tuberculous lesions in the neck are of the following 6 main types

1. Simple enlarged nodes.

2. A diffuse firm swelling (firm nodes with much periaidenitis)

3. Cystic or slightly fluctuating nodes.

4. Definitely fluctuating swellings, evidently containing fluid in quantity. These are "cold abscesses."

5. Sinuses from former abscesses which tend to persist.

6. Skin tuberculosis either about the sinuses opening or as part of a superficial cold abscess wall.

These types may occur singly or in various combinations and in various locations on either side of the neck.

The examination of patients with enlarged cervical nodes or disease of the neck should include

1. A complete history with particular reference to facts concerned in the pathogenesis of the disease.

2. A complete physical examination. The lungs, spleen, abdomen, and other lymph-node regions especially should be examined. The neck should be examined with great care and diagrams made for future reference.

3. A study of possible foci of infection made by specialists.

4. A routine urine examination, a complete blood count, and a blood Wassermann test.

5. An X-ray study of the lungs and for evidence of calcification in the diseased region of the neck.

6. In the cases of children, a skin tuberculin test.

7. A microscopic examination of fluid, curettings, or tissue removed.

8. Guinea-pig inoculation with fluid or tissues if necessary.

9. Examination of tissue removed in therapeutic operations. Tonsils especially should be sectioned.

All of the operations reported were therapeutic, that is, not merely biopsies, and in all of the cases the presence of tuberculosis was proved by examination of the tissues.

Roentgenograms of the chest were made in nearly every case and showed evidence of active tuberculosis in 13. As a rule it is not advisable to excise tuberculous lesions from patients with active disease of the chest, but there may be exceptions to this general policy if the lesions are small.

Among the cases reviewed there were 13 of permanent paralysis of the lower lip or the trapezius muscle due to operation.

Operation was followed by a completely satisfactory result in 69.4 per cent of the 131 cases. Eighty seven per cent of the patients were apparently cured, but had a defect of minor importance in their appearance or sensation.

The anesthetic used in all cases except those in which novocain was employed was ether. The ether was administered with an "anesthetometer." Until the summer of 1930, anesthesia was induced with nitrous oxide, but since that time the use of nitrous oxide has been eliminated and the amount of ether decreased by the use of avertin.

Excision is a direct therapeutic method of removing tubercle bacilli from the body. There is no cer-

tain method of destroying them in the living tissues. No doubt they are often rendered permanently inactive by non-operative treatment, but this result is uncertain, and unless the bacilli are destroyed or removed they may cause re-appearance of the disease at any time.

Excision in the early or the limited stage of the disease gives as good a surgical result as operation for inguinal hernia. This means success in about 90 per cent of the cases. As in all surgery the cases must be selected. However almost all are at some time suitable for excision. Operation is often followed by rapid general improvement.

In almost all patients with active tuberculosis in the neck some evidence of toxemia can be detected. All forms of non-operative treatment are so slow that the patient is subjected by them to an indefinite period of toxemia with possible damage to important viscera and delay of the recovery of health. Early radical removal terminates the toxemia.

CHARLES BARON, M.D.

Zweifel C.: Is Irradiation Treatment of Basedow's Disease Sometimes Fatal? (Gibt es Todesfälle im Anschluß an Basedowbestrahlung?) *Acta radiol.*, 1933 xiv 33.

The author believes that the danger of death from irradiation treatment of Basedow's disease is being

much exaggerated, especially by those who are skeptical with regard to irradiation in this condition. A survey of the literature reveals the reports of twenty-eight cases of Basedow's disease in which death was attributed to roentgen or radium irradiation. Zweifel believes that in more than half of these the death was due to some other cause such as operation, rapid progress of the disease, or a simultaneously existing infection, that it could be definitely ascribed to the irradiation in only eleven—an insignificant number considering the thousands of cases so treated. In all of the eleven cases the condition was very severe and the death occurred within from twenty four hours to ten days after the last exposure although the patient had supported earlier roentgen irradiations without any trouble. It is difficult to find an explanation for the fatal outcome in these cases. In the pathological picture there was absolutely nothing that might serve as a warning against irradiation. Zweifel believes it possible that an abnormally strong early endocrine shock reaction (Porges) may have been the responsible factor.

In conclusion Zweifel says that because of the danger of Basedow coma (Zondek) patients with Basedow's disease who are suffering from an acute infection, such as angina for example should not be given irradiation treatment.

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Localized melanomata of the gums may be removed by electro-excision.

The author's results were as follows: Of eighteen patients with cancer of the gums, eleven are clinically well and seven are dead. One of the latter died of pneumonia two years and three months after the treatment without a local recurrence. In the cured cases the cure has lasted for four years, three and a half years, and six months in one case each, for two and a half years in two cases each, and for two years and for one year in three cases each.

G. ALPHE (Z)

NECK

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1. Nodes enlarged to from 1 g to 3 cm. in diameter or a mass of 3 cm. or more persisting for longer than from six to eight weeks and associated with slight or no evidence of acute inflammation.
2. Slight fluctuation if liquefaction has begun.
3. A slight but definite constitutional reaction characterized usually by anemia, loss of energy, failure to gain weight, and loss of appetite.
4. Roentgen-ray evidence of calcification in the neck.
5. Microscopic evidence of tuberculosis in the removed tonsils.
6. Sterility of cultures of aspirated "pus" from a fluctuating part which are made on ordinary media for pyogenic cocci.
7. Positive biopsy findings. As a rule biopsy should be a radical complete excision.

Syphilis rarely if ever causes local enlargement of nodes likely to be mistaken for tuberculous nodes. A positive Wassermann reaction does not rule out tuberculosis.

The pathological changes are dependent mainly on 3 processes: cellular infiltration, necrosis, and fibrosis. These processes may be present in various combinations. In addition there is the process incident to secondary infection and the process of cicatrix formation.

Clinically tuberculous lesions in the neck are of the following 6 main types:

1. Simple enlarged nodes.
2. A diffuse firm swelling (firm nodes with much peradenitis).
3. Cystic or slightly fluctuating nodes.
4. Definitely fluctuating swellings, evidently containing fluid in quantity. These are "cold abscesses."
5. Sinuses from former abscesses which tend to persist.
6. Skin tuberculosis either about the sinus opening or as part of a superficial cold abscess wall.

These types may occur singly or in various combinations and in various locations on either side of the neck.

The examination of patients with enlarged cervical nodes or disease of the neck should include:

1. A complete history with particular reference to facts concerned in the pathogenesis of the disease.
2. A complete physical examination. The lungs, spleen, abdomen, and other lymph-node regions especially should be examined. The neck should be examined with great care and diagrams made for future reference.
3. A study of possible foci of infection made by specialists.
4. A routine urine examination: a complete blood count and a blood Wassermann test.
5. An X-ray study of the lungs and for evidence of calcification in the diseased region of the neck.
6. In the cases of children, a skin tuberculin test.
7. A microscopic examination of fluid, curettings, or tissue removed.
8. Guinea pig inoculation with fluid or tissues if necessary.
9. Examination of tissue removed in therapeutic operations. Tonsils especially should be sectioned.

All of the operations reported were therapeutic; that is, not merely biopsies, and in all of the cases the presence of tuberculosis was proved by examination of the tissues.

Roentgenograms of the chest were made in nearly every case and showed evidence of active tuberculosis in 13. As a rule it is not advisable to excise tuberculous lesions from patients with active disease of the chest, but there may be exceptions to this general policy if the lesions are small.

Among the cases reviewed there were 13 of permanent paralysis of the lower lip or the trapezius muscle due to operation.

Operation was followed by a completely satisfactory result in 69.4 per cent of the 131 cases. Eighty-seven per cent of the patients were apparently cured but had a defect of minor importance in their appearance or sensation.

The anesthetic used in all cases except those in which novocain was employed was ether. The ether was administered with an "anesthetometer." Until the summer of 1930 anesthesia was induced with nitrous oxide, but since that time the use of nitrous oxide has been eliminated and the amount of ether decreased by the use of avertin.

Excision is a direct therapeutic method of removing tubercle bacilli from the body. There is no cer-

sia contralateral sensory disturbances and, when the tumor is on the left side, aphasic disturbances predominate. In 8 anterior 11 middle, and 3 posterior cases these syndromes, in more or less typical form were noted 5 11, and 2 times, while in the remaining 4 cases no neurological symptoms of diagnostic value with regard to the site of the tumor were present.

In regard to the operative technique, the question as to whether the tumor is adherent to the longitudinal sinus or the falx cerebri, or whether it is a meningioma on the convex surface, which in spite of its rich blood supply is less dangerous, is of great importance. Because of their slow growth the meningiomas frequently reach the size of a goose egg or sometimes that of an orange before they cause symptoms. Smaller tumors may cause symptoms if they are situated in the motor area. Thickening of the bone is found in almost all cases at operation but Olivecrona could demonstrate it roentgenologically in only about half of his cases. He regards the ventriculogram as of great value. It shows a marked displacement and deformation of the ventricle with comparatively slight widening in contrast to the findings in cases of glioma.

At operation the flap of soft tissue and bone should be so placed that the longitudinal sinus is exposed for a distance of at least 10 cm. In the presence of great vascularity of the soft parts, the bone, and the dura, the surgeon must be prepared to cope with severe hemorrhage. Olivecrona places a thin layer of cotton on the bleeding dural surface, presses it firmly on the dura until the bleeding stops, and then cuts this layer of cotton with the dura which he leaves attached to the sinuses. He opens also the dura on the other side of the sinus in order not to overlook a second tumor. When the sinus has been penetrated by the tumor the advisability of resection is questionable only when the middle portion is affected, because shutting off the vena cava inferior may lead to paraplegia, whereas usually when the sinus is clogged up collateral circulation is present. The arachnoid membrane at the edge of the tumor is cut through only after the tumor has been freed from the sinus. After the necessary hemostasis the tumor can then gradually be removed. The resulting dural defect is not covered especially, but the bone flap is again put in place. A piece of rubber dam is introduced for drainage for twenty-four hours. A 1-stage operation, blood transfusion, and frequent puncture under the bone flap or lumbar puncture during the postoperative care are recommended.

Three of the author's patients died as the result of the operation. Two died from a recurrence which in 1 developed several months after the operation and in the other at the end of three years. One patient could not be followed up because he moved away. In 5 cases a smaller or greater defect remained. The remaining 11 patients (50 per cent) again became fully capable of following their occupations.

Olivecrona summarizes his large brain tumor material in 2 tables.

TABLE I—TYPES OF TUMORS

Proved tumors	No.	Percent
Gliomata	217	58.5
Meningiomata	53	14.3
Neurinomata	43	11.6
Adenomata	8	2.2
Hypophyseal infundibular cysts	11	3.0
Cholesteatomata	5	1.4
Angiomata	8	2.2
Tuberculomata	6	1.6
Metastases	14	3.8
Unclassified	6	1.6
Total	371	
Unproved tumors	117	
Suspected tumors	150	
Total	644	

TABLE II—LOCALIZATION OF MENINGIOMATA

	No.
Parasagittal	22
Convex surface of the cerebrum	7
Fissure of Sylvius	6
Suprasellar	5
Olfactory groove	1
Gasserian ganglion	2
Lateral ventricle	2
Fourth ventricle	5
Various sites	3
Total	53

In the discussion of this report, BAUER, PELS LEUDEN and OEHLECKER each reviewed 1 case of meningioma, and GULEKE discussed multiple meningiomas.

PIETZ (2)

PERIPHERAL NERVES

Bonola A: Post Traumatic Cubitus Valgus With Late Ulnar Nerve Paralysis (Paralisi tardiva dell'ulnare da cubito valgo post traumatico) *Chir. d. organi di movimento* 1932 xvii, 467

Bonola reports six cases of delayed paralysis of the ulnar nerve following early fracture at the elbow and the subsequent development of cubitus valgus. He believes that the condition is relatively frequent and that it is generally considered rare because the patient fails to give a history of fracture the accident having occurred so long before the onset of the paralysis. The paralysis has been attributed to many disorders including syringomyelia.

In a case cited the onset of the paralysis occurred fifty-one years after the fracture. In some cases the symptoms are so mild that the relation of the nerve lesion to the previous trauma is not suspected. In others, limitation of extension and flexion of the forearm pain in the joint and bony deformity are the outstanding complaints. The nerve signs begin during a period of major activity. They develop gradually and may be intermittent. Sensory signs usually precede the motor signs and at times are associated with painful paresthesias. The latter are

increased with flexion of the forearm. The sensory symptoms may disappear when the patient is at rest. Many persons with such symptoms are forced to change their occupation to reduce the constant irritation of the nerve at the elbow. Atrophy of the muscles supplied by the ulnar nerve occurs gradually. If not treated the condition may progress to complete ulnar paralysis. The paralysis is attributed to changes taking place as the result of repeated trauma to the nerve at the elbow during use of the arm.

The etiology, pathogenesis, and X ray characteristics of cubitus valgus resulting from an injury in the first ten years of life are discussed at length.

Of the six patients whose cases are reported by Bonola, five had a fracture of the external condyle of the humerus and one had a supracondylar fracture. The latent period in these cases ranged from twenty to thirty-eight years. The symptoms were those characteristic of partial or complete lesions of the ulnar nerve. Faradic and galvanic stimulation applied to the nerve and muscles elicited responses varying from signs of partial degeneration to those

of complete degeneration. Three of the patients were treated surgically. In two neurolysis and anterior transposition of the ulnar nerve at the elbow were followed by complete return of function six and seven months respectively after the onset of the symptoms. In one, a similar operation performed one year after the onset of the symptoms resulted in marked improvement. In two the ulnar nerve was found at operation to be displaced laterally and posteriorly and attached to the medial margin of the olecranon. In one, it was not displaced, but had been subjected to repeated trauma because of the associated bony deformity. In two of the surgically treated cases the nerve was enlarged to twice its normal size and had the appearance of a pseudoneuroma. On histological examination fibrous tissue was found interposed between the nerve bundles.

Various methods of treating delayed ulnar paralysis are discussed. In the author's opinion, neurolysis with anterior transplantation of the nerve is the procedure of choice. In some cases, however, transplantation and neurothaphy are necessary.

O. W. JONES, JR., M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Leo E. Purulent Mastitis in the Male (La mastite purulenta nel maschio) *Clin. chir.*, 1933 ix 209

The author discusses the etiology and pathology of purulent mastitis in the adult male (as distinct from mastitis of the newborn and adolescent male) and reports two cases, those of men aged respectively twenty-seven and twenty-two years. The condition is very rare—the chronic form more so than the acute—and its etiology is obscure.

In the first case reported by the author there was a chronic paramastitis showing multiple abscesses with fistulous openings. The temperature was normal, and there was no enlargement of the axillary nodes. The pus was sterile. Bacteriological and histological examinations were negative for tuberculous. The gland was removed completely.

In the second case the condition was an acute staphylococcal panmastitis which had begun with suppuration around the nipple. The lesion was opened and drained.

In neither case was there any suggestion of trauma, irritation or previous abnormality of the breast. The author assumes that in both cases the condition was due to a haematogenous infection, as in typhoid and paratyphoid mastitis. He believes that in the first case the primary focus was in the intestine. The second patient had suffered from perianal abscess and later from furunculosis of the face, arms, and chest.

Leo gives an extensive bibliography and appends a list of thirty-five cases of mastitis in adult males which he has collected from the literature. The first two cases were reported by Velpeau in 1858.

MARY ELIZABETH MORRIS, M.D.

Adair, F. E.: Plasma-Cell Mastitis. A Lesion Simulating Mammary Carcinoma. A Clinical and Pathological Study with a Report of Ten Cases. *Arch. Surg.*, 1933 xvi, 735

The author reports an interesting type of lesion of the breast in which there is a preponderance of plasma cells. He has observed ten cases of this lesion in the past eight years. The term "plasma-cell mastitis" was suggested for the condition by Ewing who made the pathological studies. The lesion is benign, precancerous and extremely difficult to differentiate clinically from carcinoma.

Plasma-cell mastitis has two stages, an acute stage and a residual stage. The clinician rarely has an opportunity to examine the patient during the acute stage because the pain, discomfort, and tenderness are so mild that he is not consulted.

The residual stage varies in duration from several weeks to several months. The patient seeks advice

because of a mass in the breast. The mass is not tender and may be either sharply localized or diffuse. There may or may not be a discharge from the nipple. Frequently there is oedema over the mass or in the dependent portion of the breast, giving an orange peel appearance. The nipple is retracted. As a rule there are enlarged firm axillary lymph nodes. Acute and subacute inflammatory signs are absent and the lesion closely resembles mammary carcinoma.

In the differentiation of plasma-cell mastitis it is necessary to rely on a history of inflammation. In the author's cases, even though the breast was non-lactating in all except one there was a history of acute inflammation accompanied by redness, tenderness, and discomfort. This was the most important single fact in the history.

Two cases were observed for a period of two years before operation. Practically no change took place in the lesion during this time. Even the use of the breast pump over a considerable period had little influence, in spite of the fact that some secretion could usually be obtained from the nipple ducts.

The author regards the condition as precancerous because he believes that the chemical irritation of the retained puriform material results in proliferation of the lining epithelium until sometimes there are as many as six or eight rows of hyperchromatic epithelial cells lining the ducts. Therefore when the diagnosis is made pre-operatively he treats the lesion in the same way as other precancerous lesions removing the mass itself and leaving the rest of the breast untouched.

Adair's patients ranged in age from twenty-nine to forty-four years and their average age was thirty-six and three-tenths years. The length of time since the last lactation had apparently no etiological relation to the condition. In no instance did plasma-cell mastitis occur in an unmarried woman. With the exception of one patient who had had one miscarriage the average number of previous pregnancies per patient was about four. This suggests strongly that improper drainage of the breast is an important etiological factor.

The first symptom noted by the patient was pain which was frequently accompanied by localized tenderness, redness, and a discharge from the nipple. However, these symptoms were so slight that the patient did not consult the physician until later when she noted a lump in the breast. In seven of the ten cases a thick, creamy discharge came from the nipple spontaneously or could be expressed from it.

As a rule the involved breast was heavier than the other breast, as in carcinoma. The nipple was

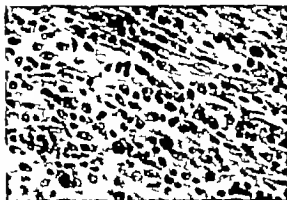


Fig. 1. High power photomicrograph showing infiltration with plasma cells. The cytoplasm is granular with eccentrically placed nuclei.

definitely retracted in eight cases and the skin was adherent in six. In four cases the skin had a definite orange-peel appearance.

The tumor mass was always firm or hard. It varied from a discrete, sharply outlined mass to a firm ill-defined but localized process. The largest mass measured 8 by 8 by 10 cm. In eight cases the axillary lymph nodes were enlarged and hard. The presence of enlarged lymph nodes was more common than in carcinoma.

The pathological interpretation by Ewing was briefly as follows:

In the particular group of cases which has attracted our attention the plasma-cell infiltration is extremely abundant and widespread, producing rather bulky tumor masses which clinically resemble active carcinoma and even under the microscope may be difficult to distinguish from cellular carcinoma.



Fig. 2. Photomicrograph showing a tremendous heaping up of duct lining cells almost filling the large ducts.

The main gross anatomical feature is the presence of many such thickened ducts which are filled with puriform material and may extend over a large segment or nearly the whole of the breast. In the most characteristic cases the cellular exudate is diffuse making a broad, opaque, somewhat yellow tumor-like mass in which the distended ducts are less obvious or even not visible.

The plasma-cell exudate begins in the walls of the ducts and extends between acini in adjoining lobules when the process becomes diffuse. Polymorphonuclear leucocytes are present in variable numbers, but are often quite scanty. The phagocytosis of fat is a prominent feature.

Proliferation of the lining epithelium is a peculiar prominent feature. The affected ducts are lined by from six to ten rows of large, somewhat hyperchromatic epithelial cells which often raise the suspicion of carcinoma of the duct. Yet the later progress of these proliferating cells ends, not in carcinoma but in generation fragmentation and formation of giant cells of all sizes. Stains for tubercle bacilli are negative, and guinea pig inoculations are also negative.

It may therefore be concluded that while bacterial infection is probably a necessary factor in the process, its influence is less prominent than the chemical effect of decomposing fatty material."

EARL O. LARSEN, M.D.

TRACHEA, LUNGS, AND PLEURA

Wall, C., and Hoyle, J. C.: Dry Bronchiectasis. *Brit. M. J.*, 1933, 4, 597.

The authors review thirty cases of dry bronchiectasis collected from the literature and twenty cases which have come under their own observation during the past two years. In seventeen of their twenty cases there was a history of measles, whooping cough, or bronchopneumonia. The most common symptom was a persistent dry cough. In every instance the diagnosis was made by lipiodol roentgenography. Hemoptysis occurred in the majority of the cases collected from the literature, but this was not true in the authors' cases.

The etiological factors of the condition are discussed. The treatment is directed toward the prevention or control of hemoptysis and sepsis.

In the authors' opinion, dry bronchiectasis is much more common than is generally believed and is often overlooked because of absence of the sputum associated with bronchiectasis of the usual type.

FRANKLIN E. WALTON, M.D.

HEART AND PERICARDIUM

Meillère, J.: Knife Wound of the Right Auricle: Suture; Recovery (Plaie de l'oreillette droite par coup de couteau; suture; guérison). *Bull. et Mem. Soc. nat. de chir.* 1933, 82, 453.

A man twenty-six years of age was admitted to the hospital twenty minutes after having received a

knife wound in the left parasternal region. Examination fifteen minutes later revealed acute anemia without dyspnea, pain, or cough. The face was pale and there was slight cyanosis of the lips. The pulse was feeble and slightly accelerated. The patient was entirely conscious, but his voice was weak. At the level of the third intercostal space on the left side 2 cm. from the sternum, there was a vertical cut 3 cm. long. A diagnosis of wound of the heart without a severe pleuropulmonary lesion was made.

Operation was performed about one hour after the injury. A progressive route of approach at the level of the third space was used. The fourth cartilage on the left side which had been pierced by the knife was resected. When it was turned outward its external extremity perforated the left pleura. Section of the third and fifth cartilages along the sternum was then done. The internal mammary vessels were ligated, and the pericardium from the anterior surface of which blood was oozing was exposed. Wide débridement was done and a moderate hæmopericardium evacuated. The wound in the anterior surface of the right auricle then became visible. The cut was a vertical linear incision 1½ cm. long from which escaped a jet of blood of about the caliber of a No. 10 urethral sound. The heart was projected by rapid irregular beats. Because of the small size of the operative field and the lack of a Tuffier retractor it could not be seized. Meillère checked the escape of blood by placing his left index finger over the wound. The rhythm immediately became regular though somewhat slow. Following the introduction of a suture at either end of the wound the rhythm became almost normal. As the suture seemed to have checked the hæmorrhage the posterior surface of the heart was not examined. Suture of the pericardium with catgut, suture of the pleural wound muscular suture and finally catgut suture over a filiform drain were done. On completion of the operation a transfusion was given.

The next day the patient's condition was satisfactory but there was slight dyspnea. On the following days the temperature rose to 40.4 degrees C and there was general weakness with slight dyspnea, cyanosis, and symptoms of hæmopneumothorax at the base. Eucalyptin-urotropin was given intravenously and a small suppurating hæmatoma discovered at the wound level was evacuated. The fever then subsided, but the general weakness persisted. About 20 c.cm. of hæmolysed blood were withdrawn from the right base. On the twelfth post-operative day the temperature rose again and there was polypnea with slight cyanosis of the face. Roentgenography showed an opacity at the left base and a mediastinal shadow causing considerable enlargement of the normal cardiopericardiac shadow. This opacity was interpreted by Meillère as indicating hæmopericardium but the patient's own physician attributed it to crowding of the heart toward the right by the pneumothorax.

After three weeks of gradual improvement the temperature again rose and thoracentesis yielded

400 c.cm. of an orange-colored fluid. Urotropin was injected intravenously. At the end of a month 250 c.cm. of a yellowish fluid were withdrawn, and a month later a smaller quantity was evacuated. By the end of another month the patient was completely cured.

Meillère regrets having used the progressive route of approach in this case as the operative field by this route is so small that manipulation of the heart is hindered and protection of the pleura is difficult. Moreover the use of this route is associated with the possibility of subsequent insufficient protection of the heart by the anterior chest wall. Meillère prefers median sternotomy to the lateral route.

The two best procedures for rapid and wide exposure of the heart in cases of cardiac wounds are (1) the method of Fontan, which has the advantage of requiring no special instruments but the disadvantage of rendering the left pleura more liable to injury and (2) the median sternotomy advocated by Duval which gives better exposure but necessitates the use of a powerful retractor which may not be available.

In the diagnosis of complications roentgen examination is of great aid. In the case reported the mediastinal shadow was due to bloody infiltration of the mediastinum. The shadow produced by this condition is triangular whereas that produced by a hæmopericardium is round. EMMET MOORE.

MISCELLANEOUS

Connors, J. F. and Stenbuck, J. B.: Penetrating Stab Wounds and Bullet Wounds of the Chest. *Ann. Surg.* 1933 xviii 538.

This article consists of a report on 68 cases of penetrating wounds of the chest operated upon between June 1, 1931 and April 30, 1932 and a description of a new operative procedure extra-pleural exteriorization of the lung injury. It includes all cases treated in order to show the difference in results in the 3 periods during the development of the method of exteriorization.

The usual treatment employed for penetrating wounds of the chest in most hospitals, suturing or packing of the superficial wound, results in cure in a great many cases but not infrequently is followed by hæmorrhage or infection. Between June 1, 1930 and May 31, 1931 45 cases of penetrating wounds of the chest were treated in this way with 11 deaths, a mortality of 24.4 per cent. After a fatal termination in 3 cases in this first period Connors decided that in the Harlem Hospital, New York, all penetrating wounds of the chest should be operated upon to arrest hæmorrhage from the internal mammary and intercostal arteries when these vessels are injured.

In the second period from June 1, 1931 to November 10, 1931 there were 32 cases with 7 deaths a mortality of 23.8 per cent.

In the third period from November 11, 1931 to April 31, 1932 the operation was extended to per

mit exploration of the deeper portions of the wound, evacuation of blood and air from the pleura, a search for lung injury and fixation of the lung in extrapleural exteriorization. In the 32 cases treated in this period there were 4 deaths, a mortality of 12.5 per cent.

In discussing the symptoms and signs and the method of examination of the patients on admission, the authors call attention to a sign which they had not seen described previously *viz.* ballooning of the skin over an area of from $1\frac{1}{2}$ to 3 in. in diameter which rises and falls with respiration at a point from 1 to $1\frac{1}{2}$ in. caudad to the wound of penetration in the skin, with no escape of air through the wound.

Hæmorrhage from the internal mammary and intercostal vessels may cause death by entering the pleural cavity. Massive hæmorrhage from the lung occurs frequently. Hæmoptyses occurred only twice in the entire series of 100 cases. Injury to the diaphragm occurred in 10 of the last 64 cases, in which an opportunity to make an examination for such injury was prevented. In 1 case the diaphragm was lacerated in 3 places. All but 1 of the diaphragm injuries were on the left side.

The abdominal viscera were injured in 4 cases of bullet wounds, but in none of the cases of stab wounds.

In the second period, in which only the chest wall was operated on injury to the lungs was found in only 3 of the 32 cases, while in the third period, in which the lung was explored a pulmonary lesion was found in 24 of the 32 cases.

The causes of death in the first period before operation was performed routinely were not determined as the autopsies were not observed by the authors. In the second and third periods, in which operation was done there were 11 deaths among the 64 cases. The causes of these deaths were (1) hæmorrhage and sudden opening of the chest cavity and disturbance of the mediastinum on the table (2) pneumonia on the right side and complete collapse of the left lung (3) tense pneumothorax occurring on the sixth post-operative day (4) hæmorrhage and abscess of the lacerated lung (5) massive hæmorrhage from intercostal vessels followed by infection (6) injury of the diaphragm with incarceration and gangrene of the fundus of the stomach (7) collapse of the lung on 1 side with compression of the lung and pneumonia on the other (8) septic pleuritis with massive collapse of the lung on the other side (9) sepsis on the seventh day arising from the chest wall where fragments of bone and bullet had remained (10) peritonitis and pneumonia following a bullet wound which caused bleeding of the gastric artery and was treated by operation performed on both the chest and the abdomen and (11) an undetermined cause.

The new operative procedure was employed in the last 32 cases. It is as follows:

Soon after admission the patient is carried to the operating room by way of the X-ray room. Anes-

thesia is induced with avertin alone or with avertin and ether. In cases in which shock is present intra-venous injections of normal salt solution are started before and kept up during the operation. Frequently 3,000 c.cm. are given on the table. Blood transfusion is employed when necessary.

On the operating table the patient lies on the unaffected side and the incision is made 1 in. or more lower than the skin wound. The skin and muscle are divided directly down to the wound in the pleura. Two or three inches of rib are resected subperiosteally. The intercostal muscle is left intact. This is important because lung tissue is later sutured to the muscle. The ends of the rib are smoothed by rongeur forceps. The intercostal vessels are ligated, the incision is enlarged and the pleural cavity explored. The lung is grasped by the sponge forceps and held up to the chest wall to prevent mediastinal flutter. The lung is examined and any lacerated portion is held by the sponge forceps. Blood is aspirated from the cavity, the lung is brought up to the chest wall, and all of the lacerated area is pulled out of the cavity and sutured in this position to the ledge of pleura, pericostum and muscle by a continuous suture interrupted at each end. The lower edge of the lung is sutured first. Iodoform gauze is gently packed into the lacerated area and around the suture line beneath the chest muscles, and the skin and muscles are sutured snugly over the gauze. The gauze is allowed to remain *in situ* for four or five days.

Even when the lung is not lacerated it is attached to the chest wall if the pleura has been penetrated, as in this way the subsequent development of a tense pneumothorax is prevented. In no case have the authors seen postoperative hernia of the lung.

The advantages of this method of operation are summarized as follows:

1. Blood and infection are prevented from entering the pleural cavity.
2. Flapping of the mediastinum is prevented.
3. Pneumothorax is diminished.
4. Lung collapse is prevented.
5. Subcutaneous emphysema does not occur.

When the abdominal organs are also injured, the chest operation is performed first.

After the operation the patient is transferred to an oxygen tent or preferably an oxygen room and ordinary supportive treatment is employed. The packing is removed after four or five days. It need not be re-inserted. The patient remains in bed for from eight to ten days.

Although they operated on all cases during the second and third periods reviewed, the authors realize that in many of them recovery would have resulted without operation. However under certain circumstances, waiting proves disastrous. They regard operation as advisable for

1. Sucking wounds. In these the mechanical disturbance of the mediastinum and lung are corrected by suture of the lung to the pleura, and even contaminated wounds are rendered harmless.

2. Wounds close to the border of the sternum where the heart and mammary vessels may be injured.

3. Cases in which the lung presents in the wound.

4. Cases in which the diaphragm may be injured.

5. Cases of tense pneumothorax.

6. Cases of marked subcutaneous emphysema.

In other cases expectant treatment is employed.

A roentgen ray examination is made every six or eight hours for two days and operation is performed if fluid or pneumothorax is found to be increasing.

G. PAUL LAROCQUE, M.D.

Ferrari R. C. and Piffero T.: Intercostal Diaphragmatic Hernia (*Hernia Intercostal o de la periferia del diafragma*) *Boi inst de clin quir* 1932 VIII, 241

The authors report a case of intercostal diaphragmatic hernia give a résumé of previously reported cases with a bibliography and discuss briefly the etiology, diagnosis and treatment. The first good description of intercostal diaphragmatic hernia was given by Alquier in 1905. To date eighteen cases have been recorded. The earliest case was reported in 1819.

The authors patient was a man aged thirty-one years, who four years previously had received a superficial wound in the ninth left intercostal space in the posterior axillary line. Six months later a soft reducible tumor appeared below the scar and slowly increased to the size of half an orange. Fluoroscopic examination showed the costodia-

phragmatic angle to be obliterated. The hernia lay below the pulmonary area and corresponded to the upper part of the renal field. The colon was normal. At operation the sac contents were found to be perirenal fat. The presence of perirenal fat in the sac has not been reported previously. The authors classify the condition in their case as an extraperitoneal or lumbar variety of intercostal diaphragmatic hernia.

The cause of these hernias is trauma to the lower part of the thorax around the costal margin with rupture of the diaphragm and the soft tissues of the intercostal spaces. Only hernia produced by gradual distention of the soft parts are of the true intercostal diaphragmatic type. The cases in which protrusion of an organ immediately follows an injury are simply thoraco-abdominal wounds with evisceration. The most frequent site of intercostal diaphragmatic hernia is the anterior part of the lower left intercostal spaces. In only one reported case was the hernia on the right side. The hernial ring is formed by the intercostal muscles. In the ten cases in which an operation was performed the contents of the sac were intestine and omentum. In one case each the sac contained the stomach and the lung.

The symptoms are of two varieties local disturbances and those related to the incarcerated organ. The differential diagnosis is not difficult in typical cases but a differentiation from pneumocele or between an irreducible hernia and a tumor of the soft parts of the thorax may be necessary.

MARY ELIZABETH MORSE, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Casella, D.: Acute Peritonitis Seen in a Military Hospital (*Le peritoniti acute nella pratica ospedaliera militare*). *Chir. chir.* 93 VII, 420.

The peritonitis secondary to gastroduodenal perforation observed in military practice is somewhat different from that observed in civil practice. The patients are seen most frequently after considerable time has elapsed since the perforation and usually have an extensive peritonitis. As a rule there is a history of excruciating abdominal pain coming on suddenly and recurring with increasing intensity. This pain may radiate to either shoulder. It finally localizes in the right or the left hypochondrium or the epigastrium. There it remains characteristically localized for a few hours, but at the end of that time it becomes diffuse as the result of extension of the peritoneal irritation to the dependent areas. There is then a board-like rigidity which persists until a diffuse advanced general peritonitis develops. Liver dullness may be decreased by the presence of free gas in the peritoneal cavity. This gas can be differentiated from intestinal meteorism because it disappears with a change in the patient's position.

In the determination of the prognosis an early diagnosis establishing the causative site of acute peritonitis is of major importance.

When the ulcer is too large to be incised and when obstruction results from closure of the perforation, a complementary gastro-enterostomy should be done.

In the cases reviewed, 55 per cent of the total number of patients operated upon survived, but of the patients who were operated upon early 85 per cent recovered.

Perforated typhoid ulcers were relatively rare in the cases reviewed as typhoid itself has been practically eliminated by vaccination. It is a serious complication because it occurs in toxic patients at the height of the infectious process when the nervous and cardiac depression is most marked. In cases of large, multiple, or confluent perforations which at times may involve segments of the entire bowel the prognosis is worse. The patient awakens with acute pain in the lower abdomen. In 90 per cent of the cases this pain is in the right lower quadrant. There is a sudden drop in the temperature to as low as 35 degrees C. and the pulse becomes rapid and thready. These changes are followed by cold sweats, meteorism, muscular defense, facies abdominalis, asthenia, cyanosis, and hiccough.

A differential diagnosis between internal hemorrhage and perforation is of little importance as in both conditions immediate surgical intervention is indicated. The poor prognosis may be modified by

immediate surgery. Of 9 patients who were operated upon with a mortality of 66 per cent, the 3 who survived were operated upon once, four and twelve hours respectively after the perforation whereas those who died were operated upon after an interval of twenty-four hours. Operation consisted of closure of the perforation with minimal trauma.

In 80 per cent of the cases reviewed the peritonitis followed acute appendicitis. In 40 of 227 cases seen in the period from 1902 to 1931 the condition was a simple cecal appendicitis with practically no peritoneal involvement. Of over 187 cases complicated by acute peritonitis, death resulted in 14 and cure in 173 (93 per cent). In all of these cases operation was performed regardless of the duration of the disease or its course. Hemostasis is essential. The base of the appendix should be inverted and buried without drainage as this limits the possibility of subsequent obstruction and lowering of the peritoneal resistance.

The treatment of any type of gastro-intestinal perforation whether secondary to gastroduodenal ulceration, typhoid fever or penetrating abdominal wounds, is immediate laparotomy with a careful search for the causative lesion and its immediate closure. The postoperative prognosis is directly related to the time which elapsed between the original insult and the operation.

SAMUEL J. FOOTE, M.D.

GASTRO-INTESTINAL TRACT

Gavazzeni, A.: Examination of the Folds of Mucous Membrane in Carcinoma of the Stomach (*L'esame delle pieghe della mucosa nel carcinoma dello stomaco*). *Radiol. med.* 1933 XI, 380.

One of the most valuable contributions of roentgenology in the last decade is accurate information regarding the normal and pathological relief of the gastric mucosa. The author reviews the development of the method and describes the various techniques employed to obtain this information. There are two chief methods. In one, a small amount of contrast medium is introduced and the stomach then distended. In the other the examination is made with the walls collapsed. Gavazzeni prefers to use a very small amount of barium sulphate, less than that generally employed, which shows the mucous membrane in more minute detail. Finely powdered barium sulphate suspended in an equal amount of water is given to the patient in the standing position and distributed over the walls of the stomach by manual manipulation. With modern apparatus, which permits rapid transition from fluoroscopy to roentgenography roentgenograms of the most characteristic findings can be made. The standing pos-

tion is best for examination of the body of the stomach and the horizontal position for examination of the antrum and cardia. After the examination in both positions has been completed, the stomach is filled with a Rieder meal and the usual examination is made.

While the new method gives much information in regard to detail, the old method cannot be dispensed with and the problem of early diagnosis of gastric cancer is by no means solved.

The normal and pathological findings made with the new method of examining the folds of mucous membrane are shown by roentgenograms and discussed. Great care must be exercised in interpreting the roentgenograms as the picture of the mucous membrane folds is influenced by various factors such as residues of food or mucus, foreign bodies in the stomach, and defects due to pressure by organs or tumors outside the stomach.

Sudden interruption of the folds is considered an early sign of carcinoma, but may occur also in benign processes and may be simulated by the presence of gas or residues of food and by imperfect distribution of the contrast medium over the stomach wall. The halo surrounding an ulcer may simulate a tumor. Large, rigid, digitiform folds are a valuable indication of the presence of cancer, but even these are not always pathognomonic. If their form can be changed by palpation they are not conclusive. As the neoplastic infiltration may extend beyond the folds, the latter do not definitely show the extent of the tumor. Similar findings may be made also in cases of syphilis and tuberculosis of the stomach. A normal mucous membrane relief quite definitely excludes the presence of cancer.

AUDREY GOSWORTHY M.D.

Cage, I. M. Ochaner, A. and Cutting, R. A.
The Effect of Insulin and Dextrose on the Normal and the Obstructed Intestine. *Arch Surg.*, 1933, xxvi, 658.

In order to determine the effects on intestinal activity of the intravenous administration of dextrose either alone or combined with insulin the authors made ninety-two observations on thirty dogs. Twenty-two of the studies were made on normal dogs, thirteen on dogs with twenty-four hour obstruction, twenty-two on dogs with forty-eight hour obstruction, twenty-five on dogs with seventy-two hour obstruction, and ten on dogs with ninety-six hour obstruction.

In both the normal animals and those with obstruction the intravenous administration of 10 per cent dextrose invariably produced a decrease in intestinal activity. There was apparently a less marked decrease in the activity of the intestine obstructed for longer than twenty-four hours than in that of the normal intestine or that of the intestine obstructed for twenty-four hours. In the normal intestine and the intestine obstructed for twenty-four hours the average decrease in intestinal tone was 2 and 38 mm. respectively, whereas in the

intestine obstructed for forty-eight hours and the intestine obstructed for seventy-two hours it was 15 and 10 mm. respectively.

Insulin alone produced an increase in intestinal activity in both the normal and the obstructed intestine in 55 per cent of the observations, the average increases in tone and amplitude being 7.2 and 3.8 mm. respectively.

Dextrose and insulin combined resulted in an increase in intestinal activity in 44.5 per cent and no change in 55.4 per cent of the experiments. Insulin preceded by dextrose produced an increase in intestinal activity in 70 per cent and no change in 30 per cent; the average increase in tone and amplitude being 12.3 and 3.3 mm. respectively. Dextrose solution preceded by insulin produced an increase in intestinal activity in 70 per cent of the experiments with an average increase in tone and amplitude of 17 and 8.5 mm. respectively. In 10 per cent there was no change and in 10.8 per cent there was a decrease in activity.

The experimental results indicate that dextrose solution exerts an inhibiting effect on both the normal and the obstructed intestine which can be largely obviated by the use of insulin. They suggest that, clinically, dextrose alone should be used cautiously and that as a rule dextrose should be combined with insulin in order to decrease its inhibiting effect on the intestine.

McIver, M. A.: Acute Intestinal Obstruction. Fifth Installment. *Am J Surg*, 1933, xx, 475.

In simple intestinal obstruction the coils of intestine above the obstruction are dilated, whereas those below it are collapsed. In the later stages the blood vessels show evidence of hyperemia and congestion. There is a cyanotic tinge. At times the intestinal wall may become almost as thin as paper. Occasionally ulcerations are caused by interference with the circulation in the bowel. These are most extreme in the cecum. Perforation may result. The contents of the bowel are thin, watery and foul smelling. The gastric and duodenal contents may contain a large number of microorganisms. In the presence of strangulation there is compression of the veins which interferes with the venous return. The lumen of the intestine becomes distended with bloody fluid exudate. If the distention is not relieved, gangrene occurs in association with complete loss of intestinal tone. In the early stages of simple obstruction there is usually an increase in the amount of free peritoneal fluid. When strangulation has occurred, this fluid is apt to be blood tinged. Peritonitis may result from perforation. Peritonitis is especially apt to occur in patients who have had the bowel opened by operation or otherwise. Of 123 autopsies performed in cases of intestinal obstruction at the Massachusetts General Hospital general peritonitis was recorded as the principal or contributory cause of death in 66. A pneumonic process may occur either as a terminal process or as the result of the aspiration of septic

vomitus. Of the 125 cases reviewed, serious pulmonary complications developed in 29.

There may be little or no change in the temperature. The pulse rate may be increased during the paroxysms of pain and is usually increased as the condition progresses. As a rule the blood pressure shows little change, but in the terminal stages it decreases progressively. The leucocyte count usually shows a slight increase, especially if strangulation is present. There is evidence of interference with the secretion of urine. By some, this has been attributed to damage to the kidneys, and by others to functional impairment.

Of great importance in intestinal obstruction are a decrease in the blood chlorides, an increase in the alkali reserve, and an increase in the non protein nitrogen of the blood together with dehydration. The author attributes the dehydration to loss of the electrolytes, especially sodium and chloride, which are secreted into the upper intestinal tract and cannot be absorbed because of the high intestinal obstruction or are lost to the body in the vomitus. If this theory is correct, the dehydration cannot be combated by the administration of water alone.

The reduction of the volume of the blood plasma results in an increase in the concentration of the plasma protein, the red cell count, and the hematocrit reading. This in turn results in an increase in the viscosity of the blood. Because in high intestinal obstruction there is a loss not only of gastric, but also of pancreatic and biliary secretion, the acid and base radicals being lost approximately proportionately there may be little change in the carbon-dioxide combining power of the plasma. If only the gastric secretion is lost there is a tendency toward the development of alkalosis, whereas if the biliary and pancreatic secretions are lost, there is a tendency toward the development of acidosis. In high intestinal obstruction in which the loss of the chloride ion does not exceed that of the base ion (both being lost proportionately) the carbon-dioxide combining power of the plasma may be altered even though the loss of chloride ions and base ions may have been excessive. This is important because one should not regard the plasma chloride concentration as an index of the degree of dehydration. An increase in the non-protein nitrogen content of the blood is even more constant than a decrease in the blood chlorides.

To explain the pain in intestinal obstruction, a number of theories have been advanced. The author agrees with Head, Ross, Hurst, and Morley that there are probably two types of pain from the abdominal viscera, one arising from the involved organs, which is dull, boring, and wearing, and the other a referred pain which is of a sharp, aching, and stabbing character. With regard to the colicky pain, McIver states that any violent disordered type of peristalsis or localized chronic contraction of a segment of intestine may be painful and the pain so produced comes directly from the gut. Upper jejunal pain is apt to be referred to the midline

between the umbilicus and the ensiform cartilage, whereas sensation from the rest of the intestine tends to be referred to the region of the umbilicus or across the abdomen above this point. Pain from the large intestine is usually referred across the abdomen and below the umbilicus.

Vomiting may be a reflex due to stimulation of the vomiting center and subsequently the result of peritonitis. In more advanced cases, regurgitation from the stomach may be responsible for it. Relief of the intra intestinal pressure by regurgitation backward of intestinal contents is beneficial and it is possible that the results obtained by a jejunostomy are produced by incomplete regurgitation into the terminal portion of the duodenum caused by angulation at the ligament of Treitz. The distention of the intestine is due to an increased amount of fluid derived from the stomach, pancreas, liver and intestine. As a result of the obstruction, the secretion of fluid is increased and absorption is retarded.

The gas present in the intestine is due partly to decomposition of the intestinal contents and varies considerably with the type of material present in the intestines at the time of the obstruction. Another source of gas is a diffusion of blood and gases into the intestinal lumen. A third source is swallowed air. The swallowing of air is especially apt to occur postoperatively. Gas is emptied from the intestine by being forced distally by peristalsis and by being absorbed from the lumen. In the presence of ileus it cannot pass peripherally and because of the distention caused by accumulation of gas occurring more rapidly than absorption, the circulation of the bowel is interrupted and thereby the absorption of gas is still further diminished.

ALTON OCKENFEL, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Tiger L. Clavel, C. and Chabannes, H.: The Gravity of Interventions on the Male Biliary Tract (Gravité des interventions sur les voies biliaires dans le sexe masculin). *Arch. franc.-belges de chir.* 1932, XXXII, 749.

The authors report that in 149 surgical operations performed in the period from 1924 to 1930 for disease of the biliary tract in women the mortality was 13.43 per cent, whereas in 21 similar operations performed during the same period for biliary disease in men the mortality was 36.36 per cent. They report the 11 cases of biliary disease in men in detail.

In a review of the literature they found that Cotte had a mortality of 18 per cent in the cases of females and 33 per cent in the cases of males. The corresponding mortalities in Villard's cases were 23 and 56 per cent, and those in Bostlin's cases, 27.21 and 71.43 per cent. In 1928, Davis reported a mortality of 3.03 per cent in the cases of females and 7.14 per cent in the cases of males. The average mortality is therefore 17.29 per cent in the cases of females and 36.78 per cent in the cases of males.

From a study of the statistics of various surgeons it is evident that the most frequent causes of death are peritonitis and pulmonary complications. Peritonitis was the cause of 35 per cent of the deaths of males and 23.5 per cent of those of females.

Hemorrhage also seems to be more common in males than females. Other causes of death seem to occur with equal frequency in males and females.

In the male the bile passages are situated deeper than in the female. Therefore they are more difficult to exteriorize and operation is technically more difficult.

As there is no test by which it is possible to determine the functional capacity of the liver with certainty it is impossible to state that hepatic insufficiency is more frequent and severe in the male than in the female. The Maillard coefficient is slightly higher in the male but by many it is considered a mediocre criterion.

The thorax of the male is more rigid than that of the female because of the more powerful musculature and the more complete ossification of the ribs and especially the costal cartilages in the male. The spinal column of the male is also more rigid than that of the female. In the male, the anteroposterior diameter is 20.83 cm. and in the female 17.32 cm.

In the female the junction of the cystic and hepatic ducts lies 7.5 cm. from the abdominal wall. In the male the distance is 11.2 cm. The greater the anteroposterior diameter the farther the biliary passages will be found from the abdominal wall. In the male the liver is more solidly fixed than in the female. Alcoholism which plays an important part in hepatic insufficiency has been more common among males than females, at least up to the last few years. It may cause also a delay in the coagulation of the blood. In cases of alcoholism, anaesthetization is more dangerous as a greater quantity of anaesthetic is required and this increases the burden on the liver. Females react more favorably to hemorrhage and resist operative shock better than males. Men are more tolerant of pain and do not come to the surgeon until a much later stage of their illness when numerous adhesions have formed. Men operated upon for biliary conditions are usually older than women treated for the same condition and the severity of reactions to operation increases with age.

In order to combat the greater mortality in the male operation should be limited to the minimal procedure (cholecystostomy) that will suffice or if exploration is imperative the incision should be that affording the widest exposure (Kehr Rio Branco Mayo). Traction on the richly innervated pedicles should be avoided to prevent respiratory and cardiac reflexes. Peritonitis should be combated by more efficient drainage. When there is plastic insufficiency of the peritoneum subhepatic peritonization should be done if necessary. Special care should be taken to obliterate with gauze omentum or some other substance the right side of the sub-

hepatic region which communicates with the greater peritoneal cavity by the parietocolic groove. A more careful pre-operative study of the patient should be made. The patient's general resistance and hepatic function should be determined from the bile index of the plasma, the findings of the rose bengal and bromosulphthalein tests the Maillard-Lanzberg coefficient, the bleeding time the coagulation time and the degree of induced glycemia. Patients in whom the chromagogue and biliary functions are both impaired before operation have less resistance to operation than those in whom only one of these functions is affected. Medical treatment should be given for as long a time as possible before operation. A detoxicating lactovegetarian diet is advisable. If the coagulation and bleeding times are increased, 3 ampoules of hemostyl may be administered daily for six or seven days and 4 gm. of calcium chloride every other day. Lambret gives a blood transfusion of from 200 to 300 c.cm. the night before the operation. He recommends also biliary opotherapy in large doses for fifteen days preceding the operation. Dupuy and Frenelle believe that the best preparation of the patient is the pre-operative injection of 1 liter of serum mixed with from 100 to 200 c.cm. of blood. Ether is the least toxic of the general anaesthetics. The ideal anaesthesia is local anaesthesia. One of the most important means of reducing the mortality is of course early diagnosis.

LEITH S. MOORE

Graham R. R., and Cannell D.: Accidental Ligation of the Hepatic Artery. Report of One Case with a Review of the Cases in the Literature. *Brit J Surg* 1933 21, 566

To the twenty-seven cases of accidental ligation of the hepatic artery recorded in the literature which they summarize the authors add a case of their own. Their case was that of a man forty nine years of age who had an extensive carcinoma of the stomach. During resection of the stomach the hepatic artery which was involved in an inflammatory mass was sectioned and ligated. Careful chemical studies of the blood failed to suggest any serious consequences. The patient had an uneventful convalescence for three days but on the fourth day signs and symptoms of pneumonia appeared and on the seventh day death occurred. Autopsy revealed bilateral pneumonia, a small quantity of peritoneal exudate and fibrous plaques and an area of early necrosis in the left lobe of the liver. The only remaining sources of arterial blood for the liver were anastomoses of the phrenic arteries in the diaphragm and possibly a small anastomosis of the left gastric artery near the oesophagus and the left lobe of the liver. The amount of liver necrosis was not sufficient to have caused death. The authors believe that if the complications had not developed the patient would have survived the accidental ligation of the hepatic artery.

Arterial blood is necessary for the maintenance of healthy liver tissue but there is evidence to show

that the anastomoses between the phrenic arteries and the hepatic artery are sufficient to maintain circulation in the liver when the hepatic artery is shut off. Of the twenty-seven cases of hepatic artery ligation recorded in the literature, death occurred in fifteen. Most of the deaths were due to liver necrosis. However it is evident that ligation of the hepatic artery is not necessarily fatal. Unfortunately there may be no clinical or laboratory evidence indicating the occurrence of necrosis.

STANLEY H. MEXTZER, M.D.

Patey, D. H. and Whitby, L. E. II.: The Paths of Gall-Bladder Infection. An Experimental Study. *Brit J Surg* 1933 22, 580.

The bacteria most commonly found in cholecystitis in man are intestinal bacteria. The routes by which they enter the gall bladder are not known with certainty.

Bacillus welchii injected into the portal veins of seventeen rabbits was recovered from cultures made of the gall-bladder wall thirty minutes later in every instance. Only two of seventeen bile specimens were positive after thirty minutes. In all of twenty-nine experiments the liver yielded positive cultures after forty-eight hours, and in eight out of nine it remained positive at the end of a week. Cultures of the systemic blood were likewise positive for twenty-four hours, but after forty-eight hours only three of fifteen were positive, and by the end of a week only one out of eight was positive.

When the inoculation was made into the systemic circulation the results were approximately the same. Even when the inoculated solutions were greatly diluted, the systemic circulation gave positive cultures five minutes after intraportal injection, showing that the liver was not an efficient filter. When dilutions were used the gall bladder remained sterile even though the systemic circulation was positive. When stronger solutions were used, the gall-bladder wall was constantly infected, but the bile remained sterile. The authors therefore conclude that the cystic artery is the route of gall-bladder infection. They state that the focus of the infection is far more likely to be the intestinal tract than a distant focus such as the teeth. Organisms lodge in the gall bladder wall, not because of elective localization but because of a decrease of local resistance. This has been demonstrated by others following ligation of the cystic or common duct.

The lymphatics from the liver to the gall bladder are not the route of infection. If they were, the gall bladder would be as constantly infected as the liver. However the authors found in their experiments that at the end of a week following intraportal inoculations the gall bladder rarely contained organisms whereas the kidneys were still usually infected and the liver was almost invariably infected. Moreover, following the injection of India ink into the portal system or directly into the liver close to the bed of the gall bladder ink particles were never found in the gall-bladder wall, even when the latter

was artificially inflamed. When tissue from transplantable carcinomatous tumors was injected, it spread by direct lymphatic extension, but although the growths developed in the liver close to the gall bladder none of them ever penetrated into the gall-bladder wall.

Descending and ascending bile-duct infections were rare.

STANLEY H. MEXTZER, M.D.

Bucalossi, P.: Experimental Researches on Cholecystectomy (*Ricerche sperimentali sulla colecistectomia*). *Chir* 1933, 12, 137.

The purpose of the author's research was to study anew the controversial problem of the anatomical and functional changes following cholecystectomy in particular the formation of a new storage reservoir for bile, the prevention of diverticulum formation by the avoidance of trauma and by reinforcement of the stump and the histology of the biliary tract and the bile flow into the duodenum after cholecystectomy. Bucalossi gives a critical discussion of the literature on these points and reports in detail his experiments on sixteen dogs.

He found that simple cholecystectomy is followed by the formation in the stump of the cystic duct, of a diverticulum which acts as a bile reservoir. This dilatation is the result of faulty technique and may be avoided by removing the cystic duct completely and then folding the stump on itself and re-inforcing it with omentum. If this method is followed, trauma, as represented by moderate compression of the line of incision with a clamp for ten seconds, does not produce a diverticulum. Complete removal of the cystic duct is particularly important because the bile current normally directed toward it exercises its pressure at this point of least resistance.

Histologically permanent alterations of the mucosa of the bile ducts are not a necessary consequence of cholecystectomy. Aside from transient necrosis of the epithelium at the site of incision, the walls of the hepatic and common ducts are found entirely normal. The fibromuscular layer apparently does not undergo compensatory thickening. The structure of the diverticulum resembles that of the hepatic ducts much more than that of the gall bladder.

The question of functional restoration of the larger bile passages after cholecystectomy has not been studied much experimentally and reports are conflicting. Bucalossi found almost complete functional compensation. The discharge of bile into the duodenum, both in intervals of digestion and following induced elimination, is closely comparable to that occurring under normal conditions. The excretory ducts undergo changes, particularly dilatation which adapt them to compensate for the storage function of the gall bladder. The bile in these ducts is so modified during pauses in elimination as to render it similar in color and viscosity to gall-bladder bile.

The author's experiments prove that the described technique constitutes a satisfactory method

of eliminating the gall bladder and that after the operation the biliary passages undergo anatomical and physiological changes which give sufficient functional compensation.

The article has illustrations and a bibliography
MARY ELIZABETH MORSE, M.D.

Graham, E. A. and Womack, N. A.: The Application of Surgery to the Hypoglycemic State Due to Islet Tumors of the Pancreas and to Other Conditions. *Surg., Gynec. & Obst.* 1933 lvi, 728

The author reports on six cases of proved tumor of the islet tissue of the pancreas which were studied at the Barnes Hospital, St. Louis, during the last few years. Three of the cases were operated upon with success. In the three others operation was not performed but the tumors were found at autopsy. In all six cases the factor of chief interest was the regulation of the sugar in the blood.

According to present conceptions, sugar equilibrium is maintained by the counterplay under nervous control of a number of factors of which the secretions of several glands are most important. Insulin from the islands of Langerhans tends to diminish the amount of blood sugar whereas the secretions of the medulla of the adrenal gland the anterior lobe of the pituitary gland, and the thyroid tend to increase it. Despite this antagonistic action, the amount of sugar in the blood of normal individuals in the fasting state that is before breakfast, does not vary greatly but is usually found to be about 0.10 per cent, or about 100 mgm. per 100 c.cm. of blood.

A syndrome of hypoglycemia has become recognized. The clinical manifestations of this condition include a feeling of malaise, lassitude, and inability to perform mental or physical work. These are often accompanied by trembling and sweating. The face may be alternately pale and flushed. There may be a fall in the temperature. With these symptoms there is usually a sensation of hunger which may be extreme and even agonizing. The sensation of severe hunger is often accompanied by yawning and mental confusion. The pulse is usually accelerated. Some of the most important and striking symptoms are related to the nervous system. Mental confusion resembling epileptic convulsions has been noted so often that the first diagnosis made in several of the reported cases of islet tumors was epilepsy. In most cases, however the crises are different from those of true epilepsy of the grand mal type. Convulsions limited to one side of the body and even to the face or the extremities have been recorded. Amnesia is another common symptom. The patients seldom remember what they have done or said during the periods of mental and psychic abnormality. In some cases even localizing signs of disorder of the central nervous system such as a Babinski sign and disturbances of the pupils, have been noted. In the more severe cases coma frequently occurs.

In many cases the neurological or psychiatric aspects of the condition are so prominent that many

of the patients with chronic hypoglycemia have been referred primarily to neurologists and psychiatrists for treatment. In general the most severe manifestations are associated with the lowest blood sugar. When the blood sugar diminishes to 50 mgm. or less per 100 c.cm. the effects are likely to be severe. In 1924 Harris reported the cases of twelve patients with blood-sugar values of less than 70 mgm. nearly all of whom presented some of the symptoms described. In 1925 Onas reported a case with epileptiform seizures. In 1927 Wilder, Allan, Power and Robertson reported a case showing a definite relationship between the symptoms and the level of the blood sugar. At autopsy in this case a carcinoma of the islets of Langerhans with liver metastases was found. In 1928 Thalheimer and Murphy reported a similar case in which autopsy disclosed a tumor of the pancreas.

The first successful operative removal of a pancreatic tumor producing symptoms and signs of hypoglycemia was done in a case reported in 1920 by Howland, Campbell, Maltby and Robinson. The patient had an encapsulated tumor in the body of the pancreas which was easily removed. After the operation the symptoms were completely relieved and the blood sugar was restored to the normal level. From the findings of microscopic examination the tumor was diagnosed as a carcinoma. In 1926, Warren reported twenty tumors of the pancreas found in autopsy material, but none of the cases was studied clinically. Lloyd, in 1929 reported a case of adenoma of the pancreas without hypoglycemia but associated with a pituitary and a parathyroid tumor. Recently Smith and Seibel reported four cases in which autopsy disclosed an adenoma of the pancreas. In one of them the tumor was definitely associated with hypoglycemia. In another there were symptoms suggestive of hypoglycemia. In a third there was no clinical evidence of hypoglycemia but the amount of blood sugar was not determined. In the fourth there was severe diabetes instead of hypoglycemia. In 1928 MacClenahan and Norris reported a case of adenoma associated with severe signs and symptoms of hypoglycemia in a man forty-two years old. At autopsy, the tumor was found to be 1.6 cm. in diameter and distinctly encapsulated. There were no mitotic figures, and most of the cells resembled beta cells of normal islands. Neighboring pancreatic tissue showed some hypertrophied islands.

At the Barnes Hospital, St. Louis, three patients have been operated upon successfully since October 1930 for the removal of active tumors of islet tissue associated with marked evidence of hypoglycemia. In the first case there was a well-encapsulated adenoma of the pancreas. The postoperative course was uneventful, and recovery was complete. In the second case the tumor was not sharply demarcated and the resection of a margin of normal pancreas about it was necessary. The bed of the tumor was closed and hemorrhage from the enlarged vessels was prevented by a pursestring suture. Convalescence was

stormy because of a pulmonary infection, but recovery was complete. The presence of normal pancreatic tissue in the tumor and the absence of a definite capsule suggested carcinoma rather than adenoma. In the third case there were two tumors which required two operations before a successful result was obtained. At the first operation an adenoma was easily shelled out. At the second operation performed two months later because the first one failed to effect a cure, a mass could be felt when the pancreas was held between the index finger and the thumb. This was resected with a portion of the tail in which it was located. Recovery was uneventful, and the symptoms were relieved completely.

To date, there have been seven cases of removal of tumors of the pancreas for hypoglycemia—the case reported by Howland in 1929, the three cases treated at the Barnes Hospital, St. Louis, one case treated at the Peter Bent Brigham Hospital, Boston, and mentioned by Cushing but not published, one case reported by Smith of Wisconsin, and one case reported by Ross and Tomasz of the Cleveland City Hospital. In none of these cases has death occurred.

Because of the absence of mortality and the uniformly dramatic nature of the recoveries, the authors conclude that prompt surgical exploration should be done in cases of hypoglycemia of unexplained origin.

The diagnosis of the presence of an islet tumor is by no means easy. Recognition of a state of chronic hypoglycemia, even when it is associated with characteristic symptoms, is not sufficient in itself for a diagnosis of islet tumor as other conditions have been found to be associated with the hypoglycemic state. In 1931 Phillips reported a case with symptoms of severe hypoglycemia and loss of consciousness. One determination of the blood sugar in this

case was as low as 25. Autopsy disclosed in addition to a subacute glomerular nephritis a marked hypertrophy of the islands of Langerhans (from 242 to 328 microns as compared with the normal of from 146 to 157 microns, as given by MacCallum).

It is well known that disturbances of the adrenal glands may be associated with hypoglycemia. There are now on record many observations showing that the blood sugar is lowered in Addison's disease, and Anderson has reported a case in which there were pronounced symptoms of hypoglycemia associated with a carcinoma of one adrenal gland.

Hypoglycemia is sometimes associated also with certain tumors of the pituitary gland, especially those arising in the chromophobe cells which cause adipose-genital symptoms of hypopituitarism. The literature on the association of pituitary lesions with hypoglycemia has been extensively reviewed by Sigwald.

Various diseases of the liver such as primary carcinoma, neo-aruphenamin hepatitis, and phosphorus poisoning, and such conditions as scleroderma are known to be associated with hypoglycemia.

Children sometimes present a clinical picture closely resembling that produced by an islet tumor which disappears spontaneously.

It is therefore apparent that the diagnosis of spontaneous hypoglycemia does not in itself establish the diagnosis of islet tumor. Moreover it is not always easy for the surgeon to recognize an islet tumor. If, for example, the neoplasm is embedded in the substance of the pancreas, its recognition may be impossible by any justifiable means.

In conclusion the authors say that when an adenoma is found in a patient with hypoglycemia the chances are very great that its removal will be followed by marked improvement.

MARGARET E. LINTHICUM, M.D.

GYNECOLOGY

UTERUS

Julien M G : Ambulatory Treatment of Retro-position of the Uterus (Traitement ambulatoire des rétropositions utérines) *Comptes rendus Soc franç de gynéc.*, 1933 III 39

Retroposition of the uterus rarely causes symptoms which necessitate or justify surgical intervention. The author describes a régime for the ambulatory management of the condition. He states that in seventy-eight cases in which it was used over a period of four years it resulted in cure or improvement in 82 per cent. In three cases of secondary sterility it was followed by pregnancy. It requires several months and demands unlimited patience and cooperation between physician and patient. Briefly it is as follows:

- 1 Medical treatment. This includes (a) exercises carried out by the patient several times daily in the lithotomy or knee-chest position and consisting chiefly of voluntary contractions of the perineal muscles; (b) the administration of endocrine products if indicated; and (c) the administration of iodides and hamamelis to stimulate the venous circulation.

- 2 Gynecological procedures. These include disinfection of the genital tract, diathermy, electrocoagulation of the hypertrophied cervix and pelvic massage.

Disinfection of the genital tract is accomplished by the administration of stock vaccines and by mechanical and chemical cleansing. It requires several weeks, and is continued until tenderness and signs of infection disappear.

Diathermy by the application of sacral supra-pubic and vaginal electrodes is given three times a week until about fifteen treatments have been administered.

Electrocoagulation of the hypertrophied cervix is done to diminish the caliber of the venous sinuses, condense the tissues and shrink hypertrophied and infected glands. The result is said to be involution of the uterus.

Pelvic massage is carried out systematically after the cervix has healed from the effects of electrocoagulation and is continued until the uterus is restored to its normal position and mobility. Pelvic adhesions responsible for retrodisplacement yield readily to massage after the described preliminary treatments have been carried out.

This mode of treatment is indicated in all cases of retroversion in which close cooperation between physician and patient can be assured. It is contra-indicated in all cases of recent acute or subacute pelvic inflammatory disease.

HAROLD C. MACE, M.D.

Serdukoff M G : Transplantation of the Endometrium. Method and Results Obtained in Amenorrhoea, Sterility and Premature Senescence (Transplantation de l'endomètre. Méthode appliquée et résultats obtenus dans l'aménorrhée, la stérilité et la sénescence prématurée) *Gynéc et obst.* 1933 XXVII 33

It is believed by the majority of research workers and clinicians that the endometrium has an endocrine function and that its specific substances will soon be discovered.

The resistance and vitality of the endometrium make its transplantation possible but transplanted endometrium can function only in the presence of normal ovaries. The author has transplanted the endometrium from one woman to another in four cases. The steps in his technique are as follows:

- 1 After a careful pelvic examination the abdomen is opened and the uterus incised in the median line of the anterior wall. The uterus is then opened like a book.

- 2 The scar tissue in the uterine cavity is very carefully removed and the cervical canal then probed with a uterine sound. Sometimes the scar tissue obliterates the cervix completely. If the cervical canal is obstructed, the incision in the uterus is enlarged down to the uterovaginal fold. As a rule the external os can then be dilated easily.

- 3 The endometrium freshly removed from another woman of the same blood group and with a negative Wassermann reaction is implanted in the uterine wall by suturing the pieces of endometrium to the muscle with catgut or grafting them into incisions in the muscle.

- 4 The uterus is then closed in two layers.

- 5 Two weeks after the operation the uterine cavity is explored after dilatation of the cervix with Hegar bougies Nos. 6 to 8. Sometimes a little dark blood appears. The dilatation is repeated at least once a month during the next four months.

The first case reported by the author was that of a woman thirty two years of age who had metritis dissecans. Examination revealed atrophy of the uterus with obliteration of the uterine cavity. The cervical os could not be found. Ovarian function was normal. The patient had suffered for five years from headaches, nose bleeding and amenorrhoea. Transplantation of endometrium was done in 1929. Since then menstruation has occurred normally.

The second case was that of a woman twenty three years old who entered the clinic in April, 1930. The last menstrual period had occurred two years previously. At that time the patient went through a normal pregnancy and normal labor at full term. After delivery she developed a puerperal infection which necessitated curettage. Since then she had

stormy because of a pulmonary infection, but recovery was complete. The presence of normal pancreatic tissue in the tumor and the absence of a definite capsule suggested carcinoma rather than adenoma. In the third case there were two tumors which required two operations before a successful result was obtained. At the first operation an adenoma was easily shelled out. At the second operation, performed two months later because the first one failed to effect a cure, a mass could be felt when the pancreas was held between the index finger and the thumb. This was resected with a portion of the tail in which it was located. Recovery was uneventful, and the symptoms were relieved completely.

To date, there have been seven cases of removal of tumors of the pancreas for hypoglycemia—the case reported by Howland in 1920, the three cases treated at the Barnes Hospital, St. Louis, one case treated at the Peter Bent Brigham Hospital, Boston, and mentioned by Cushing, but not published one case reported by Smith of Wisconsin, and one case reported by Ross and Tomasch of the Cleveland City Hospital. In none of these cases has death occurred.

Because of the absence of mortality and the uniformly dramatic nature of the recoveries, the authors conclude that prompt surgical exploration should be done in cases of hypoglycemia of unexplained origin.

The diagnosis of the presence of an islet tumor is by no means easy. Recognition of a state of chronic hypoglycemia, even when it is associated with characteristic symptoms, is not sufficient in itself for a diagnosis of islet tumor as other conditions have been found to be associated with the hypoglycemic state. In 1931 Phillips reported a case with symptoms of severe hypoglycemia and loss of consciousness. One determination of the blood sugar in this

case was as low as 25. Autopsy disclosed in addition to a subacute glomerular nephritis a marked hypertrophy of the islands of Langerhans (from 243 to 328 microns as compared with the normal of from 140 to 157 microns, as given by MacCallum).

It is well known that disturbances of the adrenal glands may be associated with hypoglycemia. There are now on record many observations showing that the blood sugar is lowered in Addison's disease, and Anderson has reported a case in which there were pronounced symptoms of hypoglycemia associated with a carcinoma of one adrenal gland.

Hypoglycemia is sometimes associated also with certain tumors of the pituitary gland, especially those arising in the chromophobe cells which cause adipose genital symptoms of hypopituitarism. The literature on the association of pituitary lesions with hypoglycemia has been extensively reviewed by Sigwald.

Various diseases of the liver such as primary carcinoma, neo-arphenamin hepatitis, and phosphorus poisoning, and such conditions as scleroderma are known to be associated with hypoglycemia.

Children sometimes present a clinical picture closely resembling that produced by an islet tumor which disappears spontaneously.

It is therefore apparent that the diagnosis of spontaneous hypoglycemia does not in itself establish the diagnosis of islet tumor. Moreover it is not always easy for the surgeon to recognize an islet tumor. If for example, the neoplasm is embedded in the substance of the pancreas, its recognition may be impossible by any justifiable means.

In conclusion the authors say that when an adenoma is found in a patient with hypoglycemia the chances are very great that its removal will be followed by marked improvement.

MARCEL E. LICHENSTERN, M.D.

had complete amenorrhea. The cervix and uterine body were found to be hard and smaller than normal. The external os of the cervix was totally obliterated. The sound could not be passed even with force. The left ovary was cystic and prolapsed. The Serdukoff operation was performed. The donor of the endometrium was a woman operated upon for fibromyoma of the uterus. Postoperative convalescence was uneventful. When the patient was discharged seventeen days after the operation the body of the uterus was somewhat large and hard and the uterine cavity measured 6 cm. Following the introduction of a sound into the uterus a slight amount of dark blood escaped.

The third case was that of a woman thirty-two years of age who had had amenorrhea ever since a curettage performed when she was twenty-five years old. Examination revealed obliteration of the cervical canal and uterine cavity, peritrophitis on the left side and a retroverted, small, and hard uterus. On examination eleven days after the Serdukoff operation the uterus was found anteverted, movable, and of normal size and consistency.

In the fourth case, Serdukoff transplanted endometrium and an ovary to a fifty-six year-old woman suffering from menopausal symptoms and psychasthenia. The donor was a woman twenty-five years old who was operated upon for bleeding caused by adenomyosis. The patient made an uneventful recovery. On September 1, 1933, about six months after the first operation, an ovarian transplantation into the abdominal wall was performed. The menopausal symptoms then ceased entirely. On pelvic examination the uterus was found anteverted and of normal size and consistency. The uterine cavity measured 7 cm. During the dilatation of the cervix a few drops of dark blood were found in the uterine cavity. Menstruation has not reappeared as yet but Serdukoff believes it can be expected as soon as the organism has gained its endocrine balance.

Serdukoff draws the following conclusions:

1. The endometrium has not only a secretory activity but also an endocrine function.
2. Its function is related to menstruation, the function of other endocrine glands, the formation of lipoids, and the formation of ferments.
3. It has considerable resistance and great vitality which facilitate its transplantation.
4. Transplantation of endometrium from one woman to another by the Serdukoff method is a simple operation which re-establishes the fundamental functions of the female and results in rejuvenation of the organism.

ISAC ALEXANDER, M.D.

Dean A. L., J.: Injury of the Urinary Bladder Following Irradiation of the Uterus. *J. Urol.* 1933 xxx 5

Pathological conditions of the bladder caused by radiation of the uterus are not uncommon and may be very serious. Sometimes they result in death. The bladder may be injured even by skilled opera-

tions and when it is protected as much as possible. It always receives some irradiation and the amount is increased when large doses are given as in cancer.

The most important irradiation reaction is the tertiary reaction formerly called a delayed radium burn. In the author's series of forty-seven cases, this was manifested from ten to one hundred and fourteen months after the treatment, an average of two years and six months. The lesion is the result of obliterative endarteritis. There is usually a white avascular central area surrounded by a zone of dilated blood vessels but in some cases the center may break down forming an ulcer with infection.

The onset of the symptoms is usually sudden. The symptoms consist of frequency, hematuria, and dysuria. The pain is acute. The hemorrhage may be severe enough to cause death as in two of the author's cases.

A correct diagnosis is very important. It is comparatively easy if the possibility of the condition is kept in mind. It is based on the history and the findings of vaginal examination, cystoscopic examination and biopsy. The patient may not associate the condition with the irradiation, as many months may have elapsed since the treatment. Biopsy is necessary as the cystoscopic picture may be indistinguishable from that of cancer. When ulcers are present as in 75 per cent of the author's cases they are located in the posterior third of the base of the bladder almost in the midline.

Before ulceration occurs, the prognosis is good. When ulceration is extensive, the prognosis must be guarded and the treatment continued for months.

In order to prevent serious bladder injury in the treatment of uterine disease by irradiation, the amount of irradiation should be limited to the minimal amount necessary for cure and the bladder should be properly shielded.

In general, the treatment of irradiation injury of the bladder is symptomatic. The principal indications are the relief of pain and the overcoming of infection. In most cases the pain can be relieved by the administration of 4 c.c.m. of tincture of hyoscyamus in water every four hours. In some cases codein may be necessary. Heat is soothing, and rest is important. Lavage of the bladder with from 1 to 2 per cent phosphoric acid is beneficial. As the patient becomes more tolerant, the phosphoric acid may be increased to 5 per cent and 20 c.c.m. of 5 per cent mercurchrome-220 soluble may be instilled. The best results are obtained by daily treatments. The treatment must be given at increasing intervals until healing is complete. The urine should be kept faintly acid. T. FLOYD BELL, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Brewer J. L., and Jones, H. O.: Granulosa-Cell Hyperplasia of the Ovary. *Am. J. Obst. & Gynec.* 1933, xxx 505

The origin of the growth of granulosa cells has been difficult to determine because the tissues have usual-

in the serum calcium. Osman and Close have demonstrated that the plasma bicarbonate also decreases. Cameron believes that during the pregnant state calcium is the main custodian of hepatic function and that the blood-calcium level is low especially when a pre-eclamptic toxemia is present.

Following the treatment of albuminuria of pregnancy suggested by Cameron, the author reports his observations of the calcium alkali therapy. The treatment is as follows:

1. In all cases of albuminuria of pregnancy an alkali compound tablet containing 40 gr of potassium citrate, 20 gr of sodium bicarbonate and 75% gr of calcium sodium lactate is given from three to five times daily.

2. In severe cases an ampoule containing 20 c. cm. of a sterile aqueous solution of 20 gr of sodium bicarbonate and 20 gr of diuretic sodium acetate is given intravenously.

3. An ampoule containing 5% gr of anhydrous calcium acetate, 1 minim of glacial acetic acid, and sterile water to make a 2 c. cm. is given intravenously. These constituents are made up to 170 c. cm. with sterile water and injected slowly with a funnel and tube.

4. When calcium is used alone, 10 per cent calcium gluconate is given in 10-c. cm. doses.

Following this treatment the albumin shows a quite remarkable decrease. If it increases again the alkali and calcium are repeated. The treatment is followed also by a fall in the blood pressure and subsidence of the edema, epigastric pain, and head ache. While these may recur, the albuminuria will usually be controlled. The urinary output is nearly always greatly increased.

The patient is allowed the usual general diet unless the toxemia is severe, when only liquids are given. The increase in the urinary output makes this treatment of great value.

As induction of labor is necessary in only a few cases, a high fetal mortality is prevented. The incidence of premature births is also greatly decreased.

The findings and treatment in fifty cases of toxemia of pregnancy including ten with eclampsia are reported. There was no mortality in these cases and the effect of the treatment was usually prompt.

DONALD G. TOLLESON, M.D.

LABOR AND ITS COMPLICATIONS

Reeb, M. and Israël, L.: Delivery After a Salt Free Dietary Régime (L'accouchement après régime déchloruré). *Gynec. et obst.*, 1933, xxvii, 193.

Since the publication of a report by Hofstein and Petrequin in 1931 which seemed to show that the administration of a salt free diet during the latter months of pregnancy materially reduces the duration of labor, Reeb and Israël have been studying this problem. From the results noted after this régime in twenty cases they conclude that a salt free diet diminishes the duration as well as the pain

of labor and greatly decreases the incidence of spasmodic states (lumbar pain, prolonged and severe uterine contractions, spasmodic contractions of the cervix). In the cases reported no other methods to expedite labor or diminish the pain were used. In the cases of ten primiparae complete cervical dilatation was obtained in an average of less than seven hours and in the cases of six secundiparae and four tertiparae it was obtained in an average of less than four hours.

The results are best when salt is completely eliminated from the diet during the last two months of pregnancy. However, as patients do not adhere to the régime strictly, the diet is usually poor in salt rather than free from salt. If the diet is followed strictly the amount of sodium chloride excreted in the urine per liter does not exceed 1 or 2 gm.

While the authors make no claim that this régime is infallible, they are convinced that when it is used in conjunction with other methods of treatment (artificial rupture of the membranes, the administration of pituitary extract and spasmalgine) labor will be rapid and painless. Attempts to find a scientific explanation for this effect were unsuccessful. Determinations of the chloride content of the blood plasma during pregnancy showed no marked deviations from the normal. Moreover, there was no change in the reaction to galvanic excitation after restriction of salt in the diet and pregnant women did not differ in this respect from non pregnant women. The authors therefore conclude that the decrease of pain has no relationship to galvanic excitability. They suggest that changes in mineral fat and protein metabolism during pregnancy may play a part, but strongly suspect that the salt free diet in some manner alters the water balance and produces its effect through dehydration.

HAROLD C. MACE, M.D.

Kreis, J.: The Physiology and Pathology of Cervical Effacement During Pregnancy. Its Relationship to Engagement of the Head and to Spontaneous Rupture of the Bag of Waters (Physiologie et pathologie de l'effacement du col au cours de la grossesse, ses rapports avec l'engagement de la tête et avec la rupture spontanée de la poche des eaux). *Gynec. et obst.*, 1933, xxvii, 97.

Studies made at the Strasbourg Gynecological and Obstetrical Clinic concerning certain factors in the mechanism of labor, particularly the rôle of the bag of waters in dilatation and effacement of the cervix, seem to show that opinions previously held must be modified. The author summarizes the results of these clinical investigations and attempts to prove that spontaneous delivery is frequently abnormal in a physiological sense and that in the majority of cases a form of treatment which he designates as "medical accouchement" is beneficial. His conclusions are as follows:

In the primipara as well as the multipara the state of the cervix, its length and its degree of permeability, present such great variations that fixed theoretical rules cannot be laid down. The variations

often result in an imperfect mechanism of effacement. Effacement of the cervix is progressive during pregnancy and occurs from within outward and from below upward. It should be achieved by the onset of labor without dilatation of the external os. From the physiological point of view the multipara should conform to the same laws as the primipara. If she does not, the difference is due, not to a mechanism different from that present in the primipara, but to a diminution of the normal tissue functions. Similar tissue abnormalities are present also in a large number of primiparae.

In the primipara engagement of the fetal head may be independent of the length and dilatation of the cervix as well as of the stage of the pregnancy. It has been observed that engagement of the head occurs more frequently when the cervix is short or widely dilated. Opening of the cervix has previously been recognized as a mechanism compensatory to effacement. Up to a certain point, progressive effacement favors engagement of the head. Therefore, from the physiological point of view it is impossible to postulate engagement of the head in the primipara without effacement during pregnancy. If the head remains mobile despite effacement, certain special inhibitory factors are present.

In the multipara the incidence of engagement of the head in the tenth lunar month is greater than that of non-engagement. Opening of the cervix being more frequent than in the primipara and the mechanism of effacement being facilitated by decreased resistance of the cervix to the contractions of the fundus, it follows that, from the physiological standpoint and from the point of view of engagement of the head, the multipara follows the same laws as the primipara. Occurring simultaneously with effacement of the cervix, there is a descent of the uterus into the pelvis and with it a descent of the external os. This descent may compensate for insufficient effacement of the cervix and thus bring about engagement of the head. Failure of this descent to occur may hinder engagement of the head in spite of cervical effacement. The same pathological and physiological mechanisms apply to engagement of the head in the primipara and the multipara with the difference that, because of mechanical abnormalities, the multipara frequently enters labor with the head unengaged.

The fate of the bag of waters (spontaneous rupture, premature rupture, or rupture at the time of complete dilatation) is usually determined by the extent to which the membranes are attached to the walls of the lower uterine segment. In general, anomalies of this fixation and faulty muscular mechanisms of effacement determine the time of rupture of the membranes before complete dilatation. Abnormal adherence of the membranes may in itself impede the normal mechanism of effacement. Premature rupture of the membranes occurs most often when effacement is distinctly retarded and least often when effacement is normal. The bag of waters is no longer considered an important factor

in the normal process of dilatation and effacement. Therefore artificial rupture of the amniotic sac is not only excusable, but indicated because, coincident with retardation of effacement, the bag of waters is one of the principal obstacles to dilatation of the cervix during labor.

HAROLD C. MACE, M.D.

Piccardo: Healing of the Myometrium After Cesarean Section (*Sulla riparazione del miometrio nel taglio cesareo*) *Arch. di ost. e ginec.*, 1935, 21, 0.

The author reviews the conflicting reports in the literature on the histology of the healing of the uterine incision after cesarean section, specifically as to whether it occurs by proliferation of muscle or by scar formation. Some investigators deny the regeneration of muscle; others believe that it occurs to a certain extent and still others find complete restitution of all layers.

Piccardo carried out three series of experiments, each on both pregnant and non-pregnant guinea pigs. A longitudinal incision was made through the entire thickness of the uterine horn and then closed with silk sutures, the site and technique being comparable to those of cesarean section. Vital staining with trypan blue was employed to study the behavior of the reticulo-endothelium in the reparative process. In the three series, the injections of the dye were begun at intervals respectively of one and a half, two and four months after the operation. The animals were killed twenty-four hours after the seventh injection. The histological findings are described at length.

Both the gravid and non-gravid uteri showed a linear scar of connective tissue which was more or less cellular depending on the postoperative interval. Regeneration of muscle appears possible soon after operation, as muscle cells in mitosis occurred in the scar. Later however this phenomenon disappeared. The proliferation of muscle cells was no greater in the pregnant than in the non-pregnant uterus. Piccardo suggests that the muscle cells are derived from the walls of the newly formed blood vessels. He concludes that after cesarean section the myometrium heals in essentially the same manner as an aseptic incision in any other organ, i.e., by scar formation. The endometrium regenerates completely as after curettage and every pregnancy.

With regard to the resistance of the cicatrix, Piccardo found that the sclerotic connective tissue is certainly no less strong than the myometrium. During pregnancy however the myometrium undergoes biological transformation, while the scar tissue remains unaffected. Although theoretically this inertia might cause disturbances during parturition, it usually does not, because of the relatively small area of uterus involved. If difficulties occur they are the same as those which necessitated the first operation.

The article has illustrations and a bibliography.
MARY ELIZABETH MORRIS, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Ross, J. K.: The Value of a Limited Bacteriological Control in the Prophylaxis of Puerperal Sepsis. *J. Obst. & Gynec. Brit. Emp.*, 1933, 21, 273

An experiment in bacteriological control with regard to the streptococcus hemolyticus over the three-year period from 1929 to 1932 is recorded from the Elsie Inglis Maternity Hospital, Edinburgh, Scotland. Increased morbidity was found in all cases in which the hemolytic streptococcus was present in the faeces or vagina during the lying-in period. No attempt was made in any case to investigate the strain of the organisms. Hemolytic streptococci were found in the genital passages in 6.8 per cent of hospital patients and in 9.6 per cent of district patients. Streptococcal infection giving rise to pyrexia occurred in 0.6 per cent of the hospital cases and in 1.4 per cent of the district cases. The cases classified as 'morbidity cases' were those showing a temperature of 100 degrees F or more on any 2 of the bi-daily readings from the first to the twenty-first day of the puerperium. There were 2,785 hospital and 989 district cases. The percentage does not support the view that uncomplicated confinements may be conducted more safely in the patient's home than in a hospital.

In cases with positive throat cultures morbidity is due chiefly to diseases of the respiratory system and mastitis. In cases with positive vaginal cultures it is usually of genital origin. In some cases (fewer than 0.1 per cent) hemolytic streptococci may be normal inhabitants of the lower vagina of the pregnant woman, but when they are present in the vagina during the last month of pregnancy they should be regarded as potentially dangerous.

A knowledge of the bacterial flora of the genital tract, especially during the last month of pregnancy and the early days of the puerperium is of value as it permits special precautions if pathogenic organisms are found. Preventive measures should include treatment of the throats of patients and attendants with positive throat cultures, treatment of the vagina during the late antenatal period and throughout labor when the vaginal cultures are positive and all measures which can be devised to protect the patient from contact with acute or sub-acute infection at home or in the hospital. The technique of the obstetrical attendant should be adequate to prevent the risk of contagion from all sources including droplet infection.

ROWLAND M. EKSTRAND M.D.

Benson W. T. and Rankin A. L. K.: Treatment of Puerperal Septicæmia with Antitoxic Serum. *Lancet* 1933 cccxv, 848.

The authors attempted to determine the therapeutic value of antitoxic serum in puerperal septicæmia due to infection with the streptococcus hemolyticus. During a period of six years they studied a series of 114 cases of this condition. The mortality of blood infection due to the strep-

tococcus hemolyticus is at least 70 per cent. The limited but very definite value of serum treatment in scarlet fever led to the use of streptococcal antitoxin in puerperal sepsis and erysipelas. It was realized that in these infections the pyogenic and invasive properties of the hemolytic streptococcus present a therapeutic problem very different from the relatively simple neutralization of exotoxin which gives such satisfactory results in scarlatina.

In each of the 114 cases the clinical diagnosis of septicæmia was confirmed by positive blood cultures during life. While it is impossible to evaluate any method of treatment in puerperal septicæmia with scientific accuracy the authors believe that by careful consideration of the patient's age and parity and the duration of her illness at the time of her entrance to the hospital they avoided many errors. To exclude variations in the virulence of the streptococcus a control case was selected for each serum-treated patient as far as possible in the same year.

The mortality in 57 cases treated with serum was 75 per cent. Twenty-four patients received serum intravenously. In several cases temporary improvement followed the injection of the serum. In a few the serum may have prolonged the agony. In many no therapeutic effect could be ascertained.

In the 57 control cases the mortality was 68 per cent. These cases were treated along general lines (19 with a mortality of 68 per cent) as well as by the intravenous administration of glucose and chemotherapy.

The authors conclude that a cure for hemolytic streptococcus septicæmia is still to be discovered.

HARRY W. FINE, M.D.

MISCELLANEOUS

Peckham, C. H. The Effect of Increasing Parity on Some Obstetrical Conditions. *Bull. Johns Hopkins Hosp.* Balt. 1933 111, 335.

In an analysis of a series of 29,227 consecutive deliveries at or near term on the obstetrical service of the Johns Hopkins Hospital, Baltimore, it was found that both the maternal and the fetal mortality rates rise with increasing parity. In the cases of multipare the maternal mortality is constantly higher than in the cases of primipare. The fetal mortality is lowest in the cases of para-i and para-ii and increases with parity until, in the cases of para-vii and above it is higher than the fetal mortality in the cases of primipare. Both the maternal and fetal mortality are significantly higher in the cases of colored women than in the cases of white women.

From a study made of some of the more common obstetrical complications to determine the cause of these differences the following conclusions are drawn.

1. There is a definite increase in the incidence of breech presentation in the cases of para-vi and above. This type of presentation occurs more frequently in white women than in colored women.

2. Transverse presentation occurs rarely in primiparae and becomes increasingly common with an increase in parity. It is also more common in white women than in colored women.

3. Eclampsia is predominantly a disease of primiparae showing no increase in the cases of women who have borne a large number of children. It occurs somewhat more frequently in colored women than in white women.

4. Nephritis increases with parity and undoubtedly is an important factor in the mortality in the cases of women who have borne a large number of children. There is very little difference in its incidence in white and colored women.

5. The incidence of total toxemia is high in primiparae. It is lowest in secundiparae. After the birth of the second child it increases steadily and rapidly. In the cases of para-viii and above it is higher than in primiparae. Very little difference is noted in its incidence in white women and colored women.

6. Placenta previa occurs most frequently in multiparae and its incidence increases with parity. It is somewhat more frequent in white women than in colored women.

7. Premature separation of the placenta occurs with about equal frequency in para-4 to para-vii. In women who have borne more than 7 children it is definitely increased. It is slightly more common in white women than in colored women.

8. The incidence of postpartum hemorrhage is highest in primiparae. After the birth of the first child it steadily decreases except that in the cases of para-x and above it shows a rather sharp increase.

It is much more common in white women than in colored women.

9. Pyelitis is most common in primiparae and decreases with increasing parity. It occurs more often in white women than in colored women.

10. Multiple pregnancy is apparently most apt to occur in para-vi and above and least apt to occur in primiparae. It is slightly more frequent in white women than in colored women.

11. Puerperal infection occurs most frequently in primiparae. After the birth of the first child its incidence decreases steadily until the para-v group is reached, when it rises somewhat. It is much more common in colored women than in white women, and is the chief cause of the greater mortality of colored women.

12. The incidence of operative delivery is highest in the cases of primiparae. It is lowest in the cases of para-iv and para-v but after the birth of the fifth child it shows a steady and rather rapid rise. It occurs much more commonly in the cases of white women than in those of colored women.

13. The smallest infants are born to primiparae. With increasing parity the weight of the child rises steadily so that the average child born to a para-x or more weighs 12 oz. more than the child of the primipara. The children of white women are on an average, several ounces heavier than those of colored women.

14. Although the mean duration of labor is naturally several hours more in the cases of primiparae than in those of multiparae, no significant change is noted with increasing parity. The average labor is definitely longer in colored women than in white women.

ALBERT W. HOGAN, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Schäfer, H. R. and Uehlinger, E.: Hypernephroma und Its Metastasen to Bone (Das Hypernephrom und seine Knochenmetastasen) *Acta radiol.* 1933 xiv 56

From the biological point of view hypernephromata occupy a special place among malignant tumors. They are most common in the sixth decade of life and occur four times more frequently in males than in females. Of the authors' thirty four cases, a single metastasis occurred in six and multiple metastases in fourteen. The metastases were found most frequently in the lungs and bones. The bone metastases are often the first metastases and are often single. In most cases they are associated with involvement of the internal organs. Multiple bone metastases occur most often in the bones of the trunk, the femur and the humerus. They are frequently found in symmetrical bones. Single bone metastases occur most often in the humerus the skull, and the proximal metaphysis of the femur. Very often the single bone metastases develop earlier than the primary tumor.

The bone metastases are almost exclusively osteoclastic processes. Roentgenograms may show typical and atypical pictures. In the long bones the typical picture is that of a central oval defect with spontaneous fracture of the diaphysis. In the flat bones the soap-bubble picture is typical. The atypical structure is observed when the destruction of the bones is very advanced, when osteosclerotic processes prevail, and when there are multiple bone metastases. If the metastases are small, the bones may show no signs of involvement in the roentgenogram.

Metastases of hypernephroma are generally rather resistant to irradiation treatment.

Sacco, E.: The Hydromechanical Relationships Between the Renal Pelvis and Kidney (Contributo allo studio dei rapporti idromeccanici tra bacinetto e rene) *Arch. ital. di urol.*, 1932 ix, 270.

Blum, in 1912 was the first to discover the mechanism of pyelovenous backflow. He found injected collargol in the peritubular lymphatic spaces. In man, the pressure which causes pyelovenous backflow is less than the renal secretory pressure. The backflow is the direct result of trauma, first to the calyces and then to the renal veins. Fuchs drew the following conclusions with regard to it:

1. Under a pressure slightly greater than the maximum secretory pressure, it is possible in 70 per cent of cases to cause the passage of pelvic contents into the renal veins.

2. Such passage occurs in the fornices of the calyces.

3. When the pelvic contents have reached the renal tissue through the pelvic rupture they proceed along the perivascular spaces of the interlobular veins and penetrate the lumina of these vessels, establishing a direct communication between the cavity of the upper urinary tract and the general blood stream.

In 1926 Bird and Morse presented opposite views. They observed that when Prussian blue was injected into the renal pelvis of the dog under a pressure increasing from 10 to 100 mm. Hg it penetrated the renal tubules and reached Bowman's capsule without causing rupture of the pelvic wall. They concluded that when the wall of the kidney pelvis is intact, pyelovenous backflow does not occur.

The author states that under normal conditions there is no direct connection between the kidney pelvis and the kidney. Except in osmotic and phagocytic processes, backflow of a fluid under pressure in the renal pelvis probably begins at the point of least resistance. Some believe that fluid introduced into the renal pelvis under pressure becomes diffused through the urinary tubules.

The fundamental question concerns the degree of pressure needed to produce pyelovenous backflow.

Shiga and Traut demonstrated that in normal kidneys the pressure can be greater than the secretory pressure and at times may reach 220 mm. Hg.

The urinary tubules, interstitial lymphatic system, and renal veins may be considered a mass of spaces and canals through which the pelvic contents can find a more or less complete route of discharge when the normal outflow of the ureters is blocked. The ideal route is through a rupture of the fornix. In the human kidney the pelvic contents usually pass into the venous system by the retrograde route through a rupture of the fornices and only exceptionally by a canalicular reflux. Under pathological conditions pyelovenous backflow takes place at a pressure less than that necessary in the normal kidney. A sudden or gradual increase in the intrapelvic pressure due to occlusion of the ureter peristaltic waves strong contractions of the abdominal walls direct or indirect trauma to the kidney or instrumental intervention will cause the direct passage of the pelvic contents into the venous system and then into the general blood stream.

The direct passage of the pelvic contents into the general blood stream through ruptured fornices protects the renal parenchyma and may retard complete destruction of the kidney.

It is probable that hemorrhage observed in the first stage following complete and permanent ligation of the ureters and occurring in intermittent

hydronephrosis is often caused by rupture of the fornices following a rapid increase in the intrapelvic pressure. **THEODORE P. GRAUER, M.D.**

Redi R.: Ectasia of the Renal Calyces (Caliectasia renalis) Arch. Ital. di chir. 1933 xxxii.

Following a review of the normal anatomy variations, capacity and physiology of the renal calyces and pelvis, the author discusses the local changes in the renal calyces which have been likened to the so-called small painful hydronephrosis. He proposes to differentiate the two conditions.

He reports eight cases in detail. In seven, the condition occurred on the left side. Its incidence in the two sexes was equal. In six cases there was a history of a previous infectious disease with some possibility of an ascending or descending infection. The symptoms were variable but consisted chiefly of fullness, heaviness, and pain in the lumbar region of the affected side. Urinary symptoms were not the rule. Examination of the urine revealed some sediment with desquamated epithelium of renal or bladder origin, bacteria, and red globules, all of which were signs of a somewhat chronic inflammation. Physical examination usually showed retraction of the abdomen. In five cases, the lower pole of the affected kidney was palpable. Cystoscopic examination usually revealed signs of an inflammatory process on the affected side with reddening and edema of the ureteral orifice. In seven cases the appearance of indigo-carmines was delayed. The capacity of the pelvis rarely exceeded 15 c.cm. and pain occurred on slight distention. Retrograde pyelography disclosed some flattening of the renal papillae and ectasia of the involved calyces. In four cases the superior calyx was involved. In three cases an accessory calyx of the superior pole and in one case, the inferior calyx.

The treatment varied with the condition of the parenchyma and the calyx involved. In cases in which the cause is determined to be a stone, papilloma, malformation, or other mechanical obstruction, the cause should be removed. This often requires nephrectomy. Dystonia with a superimposed ectasia usually calls for nephrectomy. When the cause is an acute infectious process, the condition may be relieved by decapsulation, improved drainage or lavage. Abnormalities in the position of the kidney especially ptosis with rotation of the kidney are markedly benefited by nephropexy and decapsulation. In all of the cases reported the results were good, and in some of them a complete cure was obtained.

A. Louis ROSE, M.D.

Salto, O.: The Use of Sodium Hyposulphite in the Study of the Separate Function of the Kidneys (La prova dell' iposulfito di sodio nello studio della funzionalità separata dei reni) Ann. Ital. di chir. 1933, xlii, 17

The technique of the use of sodium hyposulphite in determining the separate function of the kidneys, a test proposed by Nyiri in 1923 is as follows

The ureters are catheterized and a control specimen of urine is collected. Ten cubic centimeters of a 3% normal solution of sodium hyposulphite are then injected intravenously and the urine is collected by ureteral catheter for two hours, acidified, filtered through animal charcoal, and titrated against a N/10 iodine solution.

The great disadvantages of the method are the fact that the ureteral catheters must be left in place for a considerable time and the fact that error may be introduced by reflux into the bladder from the catheterized ureter and incomplete emptying of the pelvis of the kidney. However in the author's studies in twelve cases the test gave results comparable with those of some of the more commonly used tests of renal function. **THEODORE P. GRAUER, M.D.**

Orofino, A.: Experimental Studies of the Renal Changes Following Ligation of the Renal Vein (Ricerche sperimentali sulle alterazioni del rene in seguito alla legatura della vena renale) Ann. Ital. di chir. 1932 xli, 924

In experiments on dogs, the author performed a unilateral ligation of the renal vein by the lumbar route. By means of exstrophy of the bladder he collected the urine of both kidneys and studied the changes in their function. He found decreased elimination of salt solution by the kidney subjected to operation and hyperfunction of the normal kidney. During the first few days after the ligation, the kidney was increased in size and histological examination disclosed edema, hemorrhagic infiltrations, and more or less marked glomerulotubular lesions. Later sclerosis with increased regressive changes of the renal parenchyma developed until the kidney became very small and sclerotic. These changes coincided with the changes in the function of the kidney. The author's findings are summarized as follows:

1. Complete unilateral ligation of the renal vein of the dog by the lumbar route may cause death in from one to three days.
2. Death is not preceded by convulsions or anuria only depression, oliguria and albuminuria are noted.
3. In case of survival there is first an edema of the kidney with anuria.
4. After a day or two elimination of urine begins. The amount is less than the amount from the normal kidney and the elimination of urea is greatly reduced.
5. After a month the function of the kidney is greatly reduced.
6. With reduction of function there is a progressive decrease in the size of the organ.
7. Ligation of the renal vein is incompatible with the life and nutrition of the kidney and may result in damage to the organism through the toxic action of the renal tissue.
8. In case of a lesion or injury of the renal vein, nephrectomy is preferable to ligation of the renal vein.

THEODORE P. GRAUER, M.D.

Leni, E.: Nephrectomy in Renal Tuberculosis (*La nefrectomia nella tubercolosi renale*) *Ist. Ital. di chir.*, 1933, xxxiii, 241

The author reports his observations in twenty two cases of renal tuberculosis. The majority of the patients were between twenty and forty years of age. Sixteen of them were females. The renal tuberculosis was of the pyonephrotic type in twelve cases, of the ulcerocaseous type in eight cases, and of the type with disseminated nodules in two cases. In two cases it was associated with genital tuberculosis in seven cases, with pulmonary tuberculosis and in one case with Pott's disease. In one case calculi were found in the tuberculous kidney.

Leni believes that nephrectomy is usually indicated in renal tuberculosis, and that bilateral renal tuberculosis is not always a contra indication to removal of the more involved kidney.

In the cases reviewed follow up studies over a period varying from two to eight years disclosed the frequent persistence of bladder symptoms. In one case fistula occurred in the incision and in another a cold abscess developed.

One patient died from bilateral pulmonary tuberculosis nine days after the operation and one died from pulmonary tuberculosis four years later. Fourteen patients reported complete subsidence of all symptoms, and six reported incomplete relief.

PETER A. ROSE, M.D.

Harrah P. W.: Embryonal Sarcoma of the Kidney in Children. *J. Urol.*, 1933, xlix, 445

It has been estimated that 25 per cent of all kidney tumors occur in children. Sixty per cent of embryonal sarcomata are found in children under three years of age, and 75 per cent in children under six years of age. The embryonal sarcoma is a mixed tumor usually called adenosarcoma or Wilms tumor. Although it may contain a great variety of tissues, epithelial and connective tissues predominate. A cystic structure is not uncommon.

The tumor originates in the parenchyma usually at one of the poles and is surrounded by a capsule. As it extends at first by expansion, the kidney may assume various positions and shapes. The kidney suffers from compression and atrophy and may undergo degeneration. It has been stated that a growing organ is better able to resist tumor encroachment than an organ which is fully developed. In cases of embryonal sarcoma the enlargement is usually spherical. Metastasis does not occur early. In the later stages the capsule is broken and in filtration of other organs with adhesions and metastatic secondary growths is common. Because of the immense size which the tumor attains the abdominal organs and at times the organs in the chest are displaced.

The histological structure of the tumor depends upon the tissues which predominate. Elementary tubules of cylindrical or cubical epithelium in a bed of spindle cells of sarcomatous type are characteristic. Glomerulus-like formations are usually

found. Muscle fibers myxomatous tissue cartilage bone, and fat may be present.

The genesis of the neoplasm is doubtful. Trauma and infection have been suggested as factors in its development. According to the theory of Nicholson the tumor is a malformation of the embryonic kidney with failure of union between the melanephrogenic blastema and the ureter. The tumor is the malformed kidney itself and not a neoplasm originating in a malformed kidney. The abnormal stimulus is due to a general intoxication or infection, probably of maternal origin.

The first sign noticed is usually enlargement of the abdomen. As a rule this is followed by pallor, weakness, loss of appetite, aversion for walking, fever and constipation. In the majority of cases pain is late. The pressure of the neoplasm may cause intestinal obstruction, peripheral edema and ascites, and may interfere with lung and heart action. Urinary symptoms may be absent. Reflex anuria may occur. Albuminuria is not constant. Gross hematuria is unusual and intermittent. The only constant finding is the tumor itself.

Tumors of this type are uncommon in adults.

Of chief importance in the diagnosis is the urological examination. This should include cystoscopy with pyelography and a determination of the function of the other kidney. Biopsy may destroy the defense formed by the capsule.

The treatment indicated is nephrectomy. If the tumor is radiosensitive this should be preceded by deep X-ray irradiation. If the tumor responds to X-ray irradiation it will greatly decrease in size. If it is not operated upon then, the recurrence will be radioresistant. If irradiation is not given before operation, it should be given after operation. The mortality following nephrectomy early and late is estimated at between 86 and 95 per cent.

The authors report two cases of embryonal adenomyosarcoma: one that of a child two years of age and the other that of a child five years of age. The first patient was seen after two courses of deep X-ray therapy. The neoplasm responded to the first course, but was resistant to the second. Six months after the onset of symptoms the recurrent tumor weighed 12 lb. Nephrectomy was done, but death occurred after five months. In the second case the tumor weighed 7 lb. five weeks after the first observation of full stomach. Nephrectomy was rapidly followed by metastasis and death occurred three months after the operation.

The following conclusions are drawn:

1. When progressive abdominal enlargement is noted in a baby or child a careful examination should be made to determine its cause.
2. Malignant tumor of the kidney is not uncommon in children.
3. The absence of early pain and hematuria is due to the growth capacity of the young kidney and renders early diagnosis more difficult.
4. The prognosis of embryonal sarcoma of the kidney is very grave.

5. The treatment of choice is radiotherapy and surgery combined.

6. Regional invasions and metastases have usually occurred by the time the patient comes for examination.

CLAUDE D. PICKRELL, M.D.

BLADDER, URETHRA, AND PENIS

Maitre and Le Roy: Diastasis of the Neck of the Bladder (Contributo allo studio delle diastasi del collo vescicale). *Arch. Ital. Sci. Med.* 935, 4, 52

The authors report two cases of congenital hypertrophy of the neck of the bladder. The first was that of a patient twenty five years old and the second that of a patient forty years old. The first patient had had slowly increasing difficulty in urination since birth, and the second had had such difficulty since the age of fourteen years. In both cases the nervous system was normal and the chief finding was an enormous hypertrophy of the neck of the bladder. The walls of the bladder were also very thick, resembling those of the uterus. In the first case there was, in addition, an enormous dilatation of the right ureter. This might have been due to retention, but as it was unilateral was probably congenital. Also in favor of a congenital origin of the condition was the presence of diverticula in the bladder.

Legueu has given the name "diastasis" to a condition in which the neck of the bladder is incapable of opening. This name indicates the effect on the function of the organ of a series of anatomical changes rather than the cause of the condition. The condition develops slowly.

The treatment of diastasis of the neck of the bladder is complete resection of the neck by cystotomy usually in a single stage. This operation was performed with complete success in both of the authors' cases, but in the second case was done in two stages on account of the patient's poor condition.

AUDREY GORE MORGAN, M.D.

Beer, E.: Bladder Tumors; Diagnosis and Treatment. *Surg. Clin. North Am.*, 933 xiii, 955.

This contribution is based on Beer's experience in about 600 cases of bladder tumor. During the past thirty years the diagnosis and treatment of such tumors has been facilitated by cystoscopy, high-frequency machines, and, in selected cases, the use of radium. According to the cases reviewed, bladder tumors are 4 times as frequent in males as in females and are most common between the ages of fifty and sixty years. Chemical irritation seems to be a predisposing factor.

The most common type of bladder tumor is of epithelial origin and is primary in the bladder. Of the epithelial growths, 40 per cent are benign. The remainder include papillary carcinomas and solid nodular or ulcerating carcinomas. The most common connective-tissue tumors, which are relatively infrequent, are sarcoma, myosarcoma, mixed tumors, and myxofibroma. Metastatic tumors of the bladder from distant organs are rare. In the end-stages,

tumors of the uterus, sigmoid and rectum may invade the bladder secondarily. Years ago Hansemann emphasized the importance of anaplasia. Most pathologists today agree with him that the more the tumor conforms to the typical cells from which it arises the more benign it is, and the more it varies from the typical cell, the less differentiated and more malignant it is. There is a morphological as well as a physiological concept underlying the theory of anaplasia. Broder's attempt to determine the prognosis of malignant growths is based on Hansemann's conception, but is not always successful.

The more benign types of bladder tumors tend to produce multiple implants. Malignant metastases may follow with a benign papilloma in either the suprapubic incision or a distant organ. In cases of tumor of the bladder quiescent foci may be present in local glands for many years without symptoms.

The diagnosis of bladder tumor is made by cystoscopy. The cystoscopic differentiation between benign papilloma and papillary carcinoma is sometimes difficult. As a rule the malignant type is fleshier and shows more or less extensive areas of necrosis. The pedicle may be thick, and the adjacent bladder mucosa is edematous. In localizing the infiltration of the bladder wall opposite the site of attachment of the tumor bimanual palpation is often of great assistance. Not all bladder tumors bleed. In the author's opinion some tumors may be present for as long as twenty years without evidence of bleeding. Cystograms should be made not only to demonstrate filling defects in the bladder but also to localize tumors in a diverticulum. Intravenous urography should be used as a check-up.

The perfection of cystoscopic instruments made it possible for the author in 1910 to treat bladder tumors through the cystoscope with the high-frequency current. It is best to use the cooking action of the diathermy current. At the same sitting specimens may be removed for diagnostic purposes. At intervals of from ten days to two weeks the treatment should be repeated until the base of the tumor has been thoroughly coagulated. Check-up examinations are essential. If the tumor does not melt away and pathological examination suggests malignancy the tumor and adjacent bladder wall should be removed suprapubically. At the open operation the tumor and its base can be treated also by thorough electric coagulation with or without resection of the bladder wall and with or without seeding of the base with radium. Very excellent results are obtained. In well over 60 per cent of the cases reviewed the patient was permanently cured. At the end of the operation the author floods the entire bladder with alcohol to destroy all viable tumor cells. This is done before the packings are removed, with the table in a horizontal position. In cases of infiltrating carcinomas the end-results are not satisfactory because it is difficult to gauge the extent of the infiltration. When the infiltrating growths involve the neck of the bladder and the adjacent trigone and lateral walls, making resection impossible, Beer performs a

total cystectomy with extraperitoneal implantation of the ureters in the inguinal region where they are intubated. This is done in 1 stage. Beer prefers this method to implantation of the ureters into the sigmoid. He finds his patients comfortable and free from malignancy many years after the operation. X-ray treatment has proved useless. Although many clinics have had no good results from irradiation with radium, the author advocates the use of radium in certain cases.

MATTHEW MILLER, M.D.

Redi R., and Marri P: Partial Resection of the Bladder for Infiltrating Cancer Followed by Regeneration of the Wall of the Bladder (*Sulla resezione parziale della vescica urinaria per cancro infiltrante e sulla conseguente rigenerazione della parete vescicale*) *Arch Ital di urol.*, 1933 x, 3

This article is begun by a discussion of the comparative value of operative and non-operative treatment of malignant tumors of the bladder. The authors believe that non-operative treatment including radium irradiation should be used only when operation is impossible. Because of the excellent results obtained by electrocoagulation both by cystotomy and the endoscopic method, they are of the opinion that, in surgical treatment, the electrical bistoury should be used, especially for resection of the bladder. Incision with the electrical bistoury causes electrocoagulation of tissue that may be treacherily invaded even if only to a slight extent, by the cancer cells. The electrical bistoury puts an absolute stop to this process of dissemination and thereby prevents local recurrence.

The authors report a case in which subtotal resection of half of the bladder was done with the electrical bistoury. In the year which has elapsed since the operation there has been no recurrence. The patient's condition is now greatly improved and only a small fistula remains at the site of operation. A detailed histological description of the specimen is given. The cells were very typical showing a high degree of malignancy. The most interesting observation in this case was regeneration of the wall of the bladder including all of the layers (muscle and mucosa) from the part of the bladder that was left. Such regeneration has been described also by other surgeons. Three cases reported by Nicolich are reviewed briefly. AUGUST GOS MORGAN, M.D.

GENTIL ORGANS

Llorca F O and Botà J: The Lymphatics of the Prostate (Collecteurs lymphatiques de la prostate) *Ann d'anal path.*, 1933 x, 37

The lymphatics of the prostate leave the gland at its upper and posterior portion. They follow the course of various arteries (the anterior vesical, the prostatic, the superior hemorrhoidal) the course of the canals (the deferent canal the ureter) or pursue an independent course.

They terminate in all of the glands of the pelvis, in most of the external iliac glands, and in the infe-

rior mesenteric glands. Of these glands the prevesical gland of the first iliac bifurcation and a hypogastric gland nearly always receive the greater part of the prostatic lymph. The uppermost gland with which the prostate may have a direct lymphatic connection is the lowest left para-aortic gland and the lowest gland the median retrocaval gland.

The lymphatics issuing from the left and right sides of the prostate may after their exit from the gland, follow a median line on the anterior surface of the bladder or the promontory and thus reach the gland on the opposite side. The lymphatics of the prostate communicate with those of the bladder and rectum.

As glandular invasion occurs early in cancer of the prostate it is an important factor as it determines surgical intervention.

Clinical observations as well as anatomical findings show that the groups of glands most frequently involved are the hypogastric and external iliac glands. Next in frequency of involvement are the para-aortic glands. This invasion may occur by two routes direct or indirect. Direct invasion is very rare. Of the two indirect routes, one is parietal, following the hypogastric and first iliac chains and the other is visceral, being the superior hemorrhoidal chain of glands.

Hallopeau has called attention to the possibility of invasion of the mesenteric glands in cancer of the prostate. The authors were able to inject the mesenteric glands indirectly from the prostate by way of the superior hemorrhoidal vein.

Invasion of the inguinal glands is quite rare in cancer of the prostate. It may occur by retrograde extension from the external iliac glands or may be secondary to involvement of the tissues normally tributary to these glands and surrounding the prostate. Cancer may extend from a neoplasm of the perineum to the lower part of the rectum and the anterior part of the urethra.

Anatomical findings explain also the great frequency of vesical invasion in cancer of the prostate. The infiltration attacks the vesical musculature first, and the mucosa later. This course of invasion is probably due to the intimate relationship of the prostatic lymphatics to the muscular layer of the anterior surface of the bladder. The authors have shown that some of the lymphatics open into the prevesical glands.

In cancer of the prostate bony metastases are quite common especially in the sacrum and lumbar spine. These two localizations are explained better by lymphatic extension than by hematogenous extension. The bony metastases in these regions appear secondary to involvement of the presacral or para-aortic glands, which receive lymphatics not only from the prostate but also from these bones. There is probably a retrograde invasion from the glands to the bones.

The facts reviewed explain the enormous difficulties encountered in the treatment of cancer of the prostate.

EDWIN S. MOORE.

Mecummi, R.: So-Called Simple Prostatic Hypertrophy (Sulla cosiddetta ipertrofia semplice della prostata) *Palidini* Rome, 1933 xxxix, sec. chir 55

Of the elements constituting the prostate gland, the most important are the epithelial elements. Before puberty epithelial cells, remaining in the stroma, have no characteristic feature, only signs of a lumen or alveoli are present. With sexual maturity follicles appear. Some investigators have found only a single stratum of cylindrical cells with odd nuclei and fine protoplasmic granules, a sign of cellular activity. The secretion seems to activate the movement of, and nourish, the sperms. It is believed by some that the striated muscular tissue is derived from the striated sphincter of the membranous urethra.

Most urologists consider prostatic enlargement a neoplastic process. Virchow concluded that diffuse prostatic hypertrophy does not occur; that the only form of prostatic hypertrophy is nodular. Some urologists claim that prostatic enlargement is due to inflammation. Lasso noted the epithelial changes, the lengthening of the alveolar lumina, and the development of connective tissue and submucosal glands that form the median lobe and concluded that epithelial proliferation is a primary factor. A decrease in the contracting force with resulting retention of secretion and epithelial changes is followed by senile involution of the organ.

The theory that prostatic hypertrophy is due to inflammation is not confirmed by the findings of histological study. However inflammatory changes may be a secondary factor.

Endocrine disturbances have also been suggested as the cause of simple prostatic hypertrophy. This suggestion was based on the finding of prostatic atrophy following castration. Numerous histological studies demonstrate that the changes are not uniformly diffuse in the gland, but occur rather in disseminated nodules throughout the gland.

An important characteristic—the only means of distinguishing the newly formed nodules from other tissue—is the presence of fibroblasts.

The author presents the findings of the histological examination of forty prostates removed at operation and ten removed at autopsy. He stresses the importance of the presence of elastic fibers in the recognition of newly formed tissue. He found diffuse hypertrophy due to distention of the glandular alveoli, and the nodular form due to adenofibromyxomatous nodules.

THOROUGH P. GARCIA, M.D.

Valverde, B.: Clinical Facts Related to Chronic Vesiculitis (A propos de certaines faits cliniques liés aux épididymites chroniques) *J. d'uról. méd. et chir.* 1933, xiv, 68.

In a large urological practice the author has found chronic vesiculitis to be a common complication of gonorrhea in the male. Of 1,000 private patients, he found it in 340 and of 3,064 ward patients, he found it in 453. He does not give any explanation

for its greater incidence in private patients. Acute vesiculitis was comparatively rare.

Chronic vesiculitis may be accompanied by a large number of symptoms, including local pains, pain in the testicle, painful ejaculation, pain following coitus, rheumatoid pains of varying intensity, pain radiating toward the urethra or penis, thighs, hypogastrium or bladder and attacks of recurrent orchio-epididymitis, rheumatism, and arthritis. The author reviews cases presenting a syndrome of intoxication with pallor and malaise, fatigue, loss of virility and sexual desire, and emaciation.

The diagnosis of chronic vesiculitis is usually made by palpation and urethroscopic examination. Occasionally these measures are supplemented by roentgen examination following the injection of radio-opaque material. The enlarged vesicles can often be palpated as large indurated and tender masses above the prostate. Frequently a secretion containing gonococci can be obtained from them. Urethroscopy may show infiltration of the prostatic fossa, enlargement and congestion of the verumontanum, and a profuse discharge from the ejaculatory ducts. On the lateral walls granulations and vegetations are often present. When sodium iodide is injected large vesicles may have a very striking roentgen appearance.

The treatment consists of daily urethral lavage with a warm 1:8,000 solution of potassium permanganate, dilatation of the urethra with a Kollman dilator, the removal of polyps, vegetations, and granulations once a week by means of the urethroscope, cauterization with a 15 per cent solution of silver nitrate, two prostaticovesicular massages a week, and occasional lavage of the vesicles.

JOHN R. EMMET, M.D.

Brown, D.: Anatomical Points in Operation for Undescended Testicle *Lancet* 1933 ccxv, 456.

The author calls attention to the importance of accurately visualizing the normal structures before attempting to correct an abnormality such as undescended testicle. He describes the various fasciae involved in non-descent of the testicle and especially emphasizes the necessity of loosening the suspensory fibers where they spread out in a fan shape from the spermatic vessels at the internal ring. In addition, he divides the band at the lower edge of the internal ring, carefully avoiding the deep epigastric vessels so that there is a complete shifting inward of the cord without injury of these vessels.

F. M. COCKRELL, M.D.

MISCELLANEOUS

Vajano, D.: Roentgen Examination of the Ureter Tract by Elimination Urography (L'indagine radiologica dell'apparato urinario mediante l'urografia d'eliminazione) *Radiol. med.* 1933, xx, 508.

Vajano discusses the comparative value of ascending pyelography and pyelography by the intrave-

nous method, which latter he calls elimination urography and reviews his experience with intravenous pyelography in forty nine cases. He states that there is an essential difference in the information furnished by the two methods. The information yielded by ascending pyelography is purely morphological, while that obtained by intravenous pyelography is both morphological and functional. The factors entering into the production of the picture in intravenous pyelography are the condition of the parenchyma renal filter renal pelvis ureters bladder and peripheral circulation and the technique employed. Vajano discusses the technique and describes the picture in normal and pathological conditions.

He concludes that intravenous urography simplifies and at the same time supplements the methods available for the diagnosis of urinary diseases. It has practically no contra indications and is simple and absolutely harmless. By the use of this method alone it is possible to study many problems of morphology and function which formerly required various complicated procedures. While intravenous pyelography cannot replace the ascending method in all cases, it can be substituted for the latter advantageously in many.

From the purely morphological standpoint it is without doubt inferior to ascending pyelography as the picture given by the ascending method is more distinct and richer in contrast, the concentration of the opaque substance in the urine being much higher. However the pictures produced by the intravenous method are generally distinct enough to give the

desired information and sometimes are sufficient in themselves to show the location and severity of a kidney lesion and whether surgical operation is indicated. Moreover they conform more closely to physiological conditions than those obtained by the ascending method. The intravenous method is superior for the demonstration of certain anomalies of the urinary tract such as ectopias of the kidney bifurcated or double ureters and deviations, kinks, and diverticula of the ureters, whereas retrograde pyelography is preferable for the demonstration of slight changes such as slight defects in the filling of the renal pelvis and calyces and for cases in which diffuse meteorism interferes with the interpretation of the intravenous pyelogram.

Because of its absolute harmlessness, intravenous pyelography is to be preferred in all cases in which the cystoscope might harm the patient, as in inflammatory conditions of the ureters, bladder or adnexa tuberculosis of the bladder or kidney pregnancy old age and childhood and poor general condition. In cases of obstruction of the ureter which prevents the passage of a sound and therefore the introduction of contrast fluid, it is of course the only method possible. It usually shows the form and size of the kidney and it is of value in the diagnosis of anomalies and tumors of the upper quadrant of the abdomen, particularly in cases in which the kidney parenchyma has been destroyed by a tumor without any change in the outline of the organ.

The article has a long bibliography.

AUDREY GOWS MORGAN M D

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Dubouff G Charbonnel M., and Mased, L.:
Normal and Pathological Osteogenesis. Theories Concerning the Role of Osteoblasts (Les processus normaux et pathologiques de l'ostéogénèse. Les théories et le rôle des ostéoblastes)
La France Médicale 1933, 225.

This rather extensive article consists of three sections. In the first section the authors discuss the theories concerning the process of osteogenesis and the function of osteoblasts as they have been gradually evolved since the osteoblasts were first described by Gegenbaur in 1864. In the second section they analyze the work of Heitz Boyer Schelkewitch and Leriche and Polkard, who have been the leaders in criticism of the accepted views and are largely responsible for the newer theories concerning osteogenesis. In the third section they report their own findings and give a critical discussion of the accepted and more recent theories.

According to Heitz Boyer chemical phenomena dominate the processes of bone formation particularly the chemistry of the salts of calcium and bone repair is a process fundamentally analogous to inflammation except that the cellular activity is secondary to the chemical and inflammatory processes. In the work of Leriche and Polkard entitled

Problems of Normal Physiology and Pathology of Bone, the essential ideas of Heitz Boyer are accepted, but much greater stress is laid on the physicochemical phenomena and less importance is ascribed to the rôle of inflammation. The osteoblasts are characterized as of practically no importance in bone formation or repair.

In the repair of bone there is first an edematous infiltration at the site of new bone formation when the part is well nourished with an active blood and lymph supply. This infiltration is not found in the normal ossification of growing bone. The next phase noted in bone repair is multiplication of connective tissue fibrils, which seem to play an important rôle in the laying down of the pre-ossous substance. The authors believe that the appearance of the pre-ossous substance parallels the appearance of osteoblasts which are found close together and joined to each other by fine fibers. No active zone of true ossification exists without osteoblasts under either normal, pathological, or experimental conditions. The authors subscribe to the view that, like the odontoblasts, the specialized function of which is the formation of the enamel of the teeth, the osteoblasts are homologues of fibroblasts or cartilaginous cells. They believe that the osteoblasts arise from young connective tissue cells,

and that the use of vital staining methods has proved that these cells have a definite osteoblastic secretion, are essential to the laying down of mineral salts, particularly the salts of calcium and do not degenerate until after ossification is finished. They draw also the following conclusions:

1. The osteogenic layer of bone is present when ever necessary disappearing when its function is not needed and re-appearing under the stimulus of trauma irritation, or inflammation.

2. A periosteal layer exists over all of the bones.

3. Transplantation of periosteum does not give better results than transplantation of other organs.

4. The fibrous layer of the periosteum is a passive membrane of the same character as tendon or aponeurosis.

MARSH W. POOLE, M.D.

Albee, F. H. The Treatment of Osteomyelitis by Bacteriophage. *J Bone & Joint Surg* 1933
35

The author was very favorably impressed by the good results obtained with the Orr method in the treatment of osteomyelitis, but was not convinced that the favorable outcome was due to the factors to which they were attributed by Orr namely rest, immobilization, and the avoidance of re-infection by repeated dressings. He wondered whether the good results might not have been due to the development of a bacteriophage in the wound. With the help of MacNeal of the Department of Bacteriology of the Postgraduate Hospital, New York, he made a study of cases of osteomyelitis to determine the causative organisms and whether a bacteriophage was present or not. Of a series of 100 cases, a staphylococcus was found in pure culture in 40 per cent, a streptococcus in pure culture in 15 per cent and a mixture of staphylococcus and streptococcus in 35 per cent, the staphylococcus predominating in 58 per cent and the streptococcus predominating in 15 per cent. In 94 per cent of these cases a bacteriophage developed spontaneously.

On the basis of these findings, Albee has modified the Orr method for the treatment of osteomyelitis as follows:

The diseased bone is removed as completely as possible and two-thirds of a test tube of bacteriophage potent for the organism present is instilled into the wound so as to bathe the whole surface. The wound is then packed with a paraffin-vaseline mixture in the proportion of 3 to 1 for superficial cavities and 9 to 1 for deep cavities. This mixture is introduced into the wound in a melted state at a temperature of about 110 degrees F. by means of a large syringe. After it has cooled and hardened it fills the crevices of the wound and keeps the soft parts above the bone separated yet does not inter-

ferre with the healing process. A rubber catheter is inserted through the paraffin-vaseline wound tampon to the bottom of the bone cavity for the subsequent injection of the bacteriophage. The wound is then covered with compresses and bandaged and the part is put up in a cast. Once or twice a week 10 c.c.m. of bacteriophage are injected through the tube. After eight weeks the dressings are removed and if the wound is not healed it is redressed in the same way and the part again put up in a cast.

The average healing time in cases so treated was about six months and the average number of dressings was 5.

The advantages of the treatment described are summarized briefly as follows:

1. The method is simple.
2. It does not interfere with immobilization.
3. The paraffin vaseline tampon yields to the healing tissues.
4. It permits the periodical introduction of bacteriophage.

In a comparison of irradiated vaseline with ordinary vaseline with regard to their effect on cultures of streptococcus and staphylococcus and on the action of bacteriophage, Albee noted no difference.

FRANK MCKENNEY M.D.

Meyer and Welos: Two New Cases of Osseous Sporotrichosis (Deux nouveaux cas de sporotrichose osseuse) *Rev d'orthop.*, 1932 xxxix 696

Osseous sporotrichosis presents many different clinical pictures, but the most common resembles that of chronic osteomyelitis.

The first case reported by the authors was that of a man thirty five years of age who sought treatment for pain and disability in the right heel. In 1908 when the patient was twelve years old, he had an infection in the heel which necessitated operation for the removal of a sequestrum. He recovered sufficiently to serve through the war. In 1931 the condition recurred and a small piece of bone was discharged spontaneously. Physical examination a few months later disclosed swelling and tenderness of the heel. Motion in the toes was normal, but subastragaloid and ankle movements were painful. The temperature was 37.3 degrees C. Roentgen ray examination showed irregular areas of decreased and increased density in the os calcis and astragalus and subastragaloid and calcaneocuboid ankylosis. The thick yellow pus evacuated at operation was found on microscopic examination and culture to contain the granules of sporotrichosis. The patient recovered in three weeks sufficiently to resume his work.

The second case was that of a woman of thirty two years who complained of pain and aching in the thigh which had gradually increased until she was unable to walk. Roentgen ray examination revealed an oval area near the lesser trochanter which looked like a bone cyst with more dense bone around its borders. At operation this cavity was found filled with debris. There was no free pus. Curettage disclosed the organisms of sporotrichosis. After about

three weeks the patient was able to walk without difficulty.

In both of these cases 6 gm. of potassium iodide were given daily. WILLIAM ARTHUR CLARK M.D.

Milch, H. and Burman M. S.: Snapping Scapula and Humerus Varus. A Report of Six Cases. *Arch Surg* 1933 xxvi 570

Milch and Burman review the literature on snapping shoulder discuss its mechanism and report six cases. They state that friction sounds in the region of the scapula may be due to irregularities of the scapula or chest wall, changes in the musculature or changes in bursae present at this site. Only conservative treatment is required as a rule but the authors recommend surgical removal of bony prominences if such appear to be the underlying cause.

Attention is called to the peculiar conformation of the head of the humerus noted in one of the authors' cases a condition described by Reisdenger as humerus varus. This causes no symptoms, limitation of movement, or discrepancy in the relative length of the arm, and requires no treatment. It is an interesting roentgen ray finding which is most easily identified in roentgenograms taken with the arm externally rotated and somewhat abducted.

PAUL C. COLONNA, M.D.

Satter F.: Tuberculous of the Wrist (La tuberculose du poignet) *Rev d'orthop.*, 1932 xxxix 609

Tuberculous arthritis of the wrist has an unfavorable prognosis because of the multiplicity of the joint surfaces the tendency of the disease to spread to all of these surfaces the danger of diastical adhesions in the tendons and the frequent association of the condition with tuberculosis of the lungs.

The aims of treatment are the preservation of as much function as possible in the fingers and the production of total or partial ankylosis in the carpus. Conservative methods are preferred to surgical intervention. Radiotherapy combined with heliotherapy seems to be of greatest value. Heliotherapy should be general and radiotherapy should be applied locally with ionization by electrodes. To insure immobilization a simple splint should be applied. Any deformity present should be corrected slowly by elastic traction. Great care should be exercised to preserve motion in the fingers. The wrist may be allowed to become completely ankylosed in all of its joints as well as with the radius and metacarpals. Even when this occurs function in the hand will be fairly good if the finger joints are not permitted to get stiff.

In cases of very extensive lesions which have persisted for a long time surgery may be necessary. The operation of choice is resection of the entire carpus, but because of the relative lengthening of the tendons and the adhesions which may form around them, this operation is rarely followed by good finger function. In extreme cases with progressive necrosis and systemic retrogression amputation may be required.

The authors report eight cases in detail and give statistics based on fifty-four cases. A cure was obtained in 50.8 per cent and improvement in 42.1 per cent. In 7.02 per cent the condition remained unchanged.

WILLIAM ARTHUR CLARK, M.D.

Petter, C. K.: Methods of Measuring the Pressure of the Intervertebral Disk. *J Bone & Joint Surg* 1933, 25: 365

When a block of two or more vertebrae of the spines of persons dying from tuberculous was measured, its length was found increased after its separation from the remainder of the spine. Still greater lengthening occurred after section of the periphery of the annulus fibrosus of the intervertebral disks. These changes demonstrated an expansion of the disks after their removal from the body. By measurement the expansion was found to be 1.08 mm. The pressure required to reduce this expansion averaged 30.5 lb. CHERRIE C. GUY, M.D.

Luccioni, E.: Contribution to the Study of Osteomyelitis of the Vertebrae (Contributo allo studio dell'osteomielite vertebrale). *Chir chir* 1933, 12, 304.

The author reports a case of osteomyelitis of the fourth lumbar vertebra and reviews the etiology, pathology, symptoms and treatment of the condition. The patient was a girl fifteen years of age who for three days prior to her admission to the hospital complained of a swelling in the lumbar para-vertebral region. This area was drained and the patient was given supportive treatment, but death occurred five days after the onset of the symptoms.

Postmortem examination revealed an acute osteomyelitis of the fourth lumbar vertebra with infiltration of the periosteum and of the superior intervertebral disk. The pus had entered the spinal canal. The dura mater was hyperemic. Longitudinal section of the vertebra showed destruction of all of the spongy bone except a thin layer adjacent to the articulating surfaces. The pus yielded a pure culture of the staphylococcus albus. PETER A. ROSE, M.D.

Benoliste-Pillioire, C. and Gourdon, R.: A New Case of Vertebral Osteochondritis in a Child (Un nouveau cas d'ostéochondrite vertébrale infantile). *Bull de l'Acad. Soc. de Ch. Org. et Par* 1933, 22, 68.

The authors report a case of vertebra plana (Calvé 1923) in which the vertebral changes were observed in the early stages of the disease. The patient, a boy four years old, was first seen about two months after the onset of symptoms. His first complaint of pain in the back and the parents noted that in picking up objects from the ground he stooped rather than bent over. For the eight days preceding examination the pain had been severe.

On physical examination the child was found to be in fair general condition and large for his age. The back was rigid because of muscle spasm, and the slightest movement caused severe pain. There was

neither a gibbus nor an abscess. The lower extremities were hyperaesthetic. The temperature varied between 99 and 100.9 degrees F.

Under treatment by continuous extension, the spine gradually became painless and freely movable. Complete recovery resulted in ten months.

The first roentgenogram revealed a flattening of the first lumbar vertebra of about 50 per cent and a massive decalcification. Seventeen months later the vertebra had become reduced to a dense lamella 2 mm. thick anteriorly and 4 mm. thick posteriorly. There appeared to be a slight anteroposterior elongation. The adjacent intervertebral cartilages appeared somewhat thickened and presented a laminated aspect. The nuclei of the cartilage were more dense than normal. Subsequent roentgenograms showed recalcification and an increase in the height of the vertebra. At no time was there evidence of an abscess.

The authors believe that the clinical and roentgenological aspect of vertebra plana can be produced by a variety of pathological processes, but that in the case reported the cause was a low-grade osteomyelitis. ALBERT F. DEGRAAT, M.D.

Pavlovski, A. J. and Fitts, M.: Metastatic Cancer of the Vertebrae (Cancer metastatico vertebrale). *Rev de chir. v. 1931* 1931, 11, 321.

In discussing the differentiation of metastatic carcinoma from other diseases of the spinal column, chiefly Pott's disease, the authors report four cases of the former condition, supplementing the case histories with roentgenograms.

In vertebral carcinoma the affected vertebrae are flattened and the bone structure is destroyed while the intervertebral disks remain unaffected. In Pott's disease, which affects cartilage, there are early lesions of the intervertebral disks. The disks become progressively thinner and finally disappear entirely. Sometimes a vertebral metastasis, either because it is particularly malignant or because it is implanted near the pedicle, destroys the body of the vertebra partially without greatly flattening it and invades the soft parts early or invades the vertebral canal, causing early paraplegia. As a rule, however, there is marked flattening of the vertebra before the development of paraplegia.

It is important to make a roentgen examination of the rest of the skeleton, particularly the flat bones and the ribs, as there may be metastatic foci which are silent clinically but of importance for confirmation of the diagnosis. AUDREY GORE MORGAN, M.D.

Markelov, N.: Osteochondritis Dissecans (Osteochondritis dissecans). *Nov chir. Arch.*, 1933, 22, 593.

According to its origin, osteochondritis dissecans belongs to the chondropathies of the type of Koeber's disease and Legg-Calvé-Perthes disease. It is due to a wedge-shaped necrosis of the epiphyses of the tubular bones or partial chondroplasty of the articular surface resulting from a vascular embolism.

Most frequently affected is the knee joint especially its median femoral condyle. Next in order of involvement are the elbow (head of the radius) hip shoulder ankle, and the smaller articulations of the foot. Occasionally both of the articular bones of the knee joint or even both knees are affected. The condition is most common between the sixteenth and twenty-fourth years of age but has been known to occur as early as the ninth year and as late as the fiftieth year.

Osteochondritis dissecans may present two stages. The first stage which lasts about two years is characterized pathologically-anatomically by sequestrum formation and sequestration. When it involves the knee it causes indefinite pain swelling of the joint and limping. The second stage is characterized by the formation of a free joint body, a bone niche from which the joint body fell out attacks of severe pain disturbances of motility so-called locking of the joint body and chronic arthritis without very pronounced intervening symptoms.

A correct diagnosis can be made in both stages by roentgenography. In the first stage of involvement of the knee there is found at a typical site the median condyle of the femur a usually wedge shaped or circular sharply outlined focus of rarefaction in the bone substance (niche) in which lies a sequestrum. In the second stage the bone niche is empty and the sequestrum is found in the joint cavity. In the differential diagnosis it is necessary to rule out injuries of the internal meniscus, chondromatosis chronic traumatic synovitis incarceration of the os fabella or other accessory joint bones traumatic intra-articular free bodies and true arthritis deformans.

In the first stage conservative physical therapy may be beneficial. In the second stage operative removal of the free joint body is indicated. Some surgeons favor operative treatment in the first stage but this requires accurate roentgenological localization of the necrosed focus as the normal looking articular cartilage cannot be differentiated from the bone defect covered by it or from the sequestrum lying in the defect by either inspection or palpation. Operative treatment in the first stage may be technically very difficult.

The author's material consisted of thirteen knee joints (ten with involvement of the median articular bones—in one of which the involvement was symmetrical—and three with involvement of the lateral condyles) and five elbow joints (three with involvement of the eminentia capitis and two with involvement of the head of the radius in one of which the involvement was symmetrical).

G. ALIPOV (Z)

Bado J. L., Rolli D. V. and Sofera E. V.: So-Called Cyst of the Meniscus of the Knee (Sobre el llamado quiste del menisco de la rodilla). *Rev de ortop y traumatol.*, 1932 II, 203.

Cysts of the meniscus of the knee joint were first described by Ebner in 1904. The authors report two

cases and describe the histological findings in detail with the aid of photomicrographs. About seventy cases are on record. The majority of the subjects were males between fifteen and thirty years of age. The youngest patient was eight years old, and the oldest, sixty years.

The cysts generally reach their maximum size in a short time and then remain stationary. They are generally on the external surface of the meniscus. The swelling is seen most frequently in the joint interline in front of the insertion of the tendon of the biceps, between the latter and the external margin of the patellar tendon. However it may protrude at the posterior border of the biceps and suggest a posterior hernia of the synovial membrane of the joint or a cyst of the upper tibiofibular joint. As a rule the size of the cyst decreases on flexion and increases on extension but occasionally it is more marked in flexion than extension.

There is pain in the joint but it is generally not intense. Extension and flexion are limited and in some cases blocking of the joint occurs. Sometimes there is slight atrophy of the muscles of the thigh or leg. The diagnosis is not difficult if the condition is borne in mind.

The best treatment is surgical removal of the meniscus. Some surgeons have removed only the cyst, but in most of the cases in which this has been done a recurrence has developed.

In about 50 per cent of the cases the immediate cause of the development of the cysts is trauma. The ultimate cause is degeneration of fibrocartilage probably brought about by circulatory disturbances.

AUDREY GORE MORGAN M D

Krida, A.: Intermittent Hydrarthrosis of the Knee Joint. A Report of 2 Cases Apparently Cured by Synovectomy Together with the Pathological Findings. *J Bone & Joint Surg* 1933 XI, 449.

Intermittent hydrarthrosis is described as a chronic condition in which there are repeated joint effusions of several days duration which are refractory to salicylates, unaccompanied by pronounced manifestations of inflammation, cardiac disease or joint deterioration and recurring usually at regular intervals. The first case was reported by Perrin in 1845. In 1926 Schlenker found about 100 cases in the literature. Among the factors in the causation of the condition are trauma, infectious arthritis, menstruation, pregnancy and allergy. Regardless of the type of treatment the prognosis is not good.

In 1 of the 2 cases reported by the author the condition was of seven months duration and in the other of six years duration. In each a synovectomy was done. In 1 there had been no recurrence of symptoms one year after the operation and in the other there had been no recurrence eight months after the operation.

The article contains several photomicrographs of sections of the resected synovial membrane.

ARTHUR H. WELAND M D

Santi E.: Osteomyelitis of the Fibula (Le osteomielite del perone) *Glia. chir.*, 1933 ix, 585.

Santi reports a series of twenty-nine cases of osteomyelitis of the fibula from the Surgical Pediatric Clinic of Florence and reviews the etiology, pathology, symptoms, and diagnosis. Osteomyelitis of the fibula was found in 8.5 per cent of the total number of cases of osteomyelitis. This is a higher incidence than has been reported by others.

In Santi's opinion, opening of the medullary canal is necessary only in the hyperacute cases associated with septicemia. In the acute cases without septicemia incision of the soft parts is sufficient. Sequestrectomy is indicated when complete demarcation of the dead bone has occurred and the patient's condition will permit it.

PETER A. ROW M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Millic, A.: The Treatment of Volkmann's Ischemic Paralysis by Elastic Traction. A Report of Seven Cases. *J. Bone & Joint Surg.* 1933 xv 36.

In the treatment of Volkmann's ischemic paralysis by elastic traction, Millic applies the traction by means of Japanese finger traps. The splint is devised to produce the initial traction with the wrist in flexion. When the fingers reach complete extension in this position the wrist is gradually extended by the adjustment of a hinge until eventually complete extension and then dorsiflexion of the wrist is attained. When the corrected position is obtained the hand and fingers are immobilized for from four to six weeks.

Millic believes that all cases of Volkmann's ischemic paralysis, regardless of the duration or severity of the condition can be benefited by this method of treatment. ARTHUR H. WEILAND M.D.

Carera U.: Thirty-Two Cases of Orthopedic Shortening of the Normal Leg (32 casi di accorciamento dell'arto inferiore sano a scopo ortopedico) *Chir. d'organi di movimento* 1933 xvii, 509.

In 1928 the author reported four cases in which he had successfully shortened the normal leg instead of lengthening the abnormal leg in the treatment of various types of shortening. He has since improved the procedure and now concludes from his experience that it is in general better than the methods which involve traction on the short leg. His operation has three indications: (1) irreducible congenital dislocation of the hip (seventeen of his cases), (2) sequelae of infantile paralysis (eight of his cases), and (3) sequelae of hip disease (seven of his cases). The operation is done only when there is shortening of at least 6 cm. The amount of shortening is determined by careful measurements.

The normal leg is first enclosed in a cast applied from the waist to the sole of the foot. Resection of the femur is then done through a window in the cast, the amount of bone removed corresponding to the

amount of shortening desired. The operative technique is shown by illustrations.

After the operation the leg is immobilized usually for fifty days, the patient is given a high-calcium diet, and the status of the operative field is checked up by frequent roentgenograms.

The results in the author's thirty-two cases were very satisfactory. Non-union and infection are uncommon.

EDWARD T. LUDWIG M.D.

FRACTURES AND DISLOCATIONS

Putti, V.: Analyses of the Roentgen Symptom Triad of Predislocation States (Analisi delle triade radiosintomatica degli stati di predislocazione) *Chir. d'organi di movimento* 1933 xvii, 433.

Putti stresses the importance of early roentgen-ray signs in the diagnosis of congenital dislocations and reports the results of studies which he made of roentgenograms of normal infants and infants developing dislocations in an attempt to discover signs of predislocation states. The following three important changes were noted:

1. Abnormal obliquity of the roof of the acetabulum. In roentgenograms of infants from twelve hours to eight days of age, Putti distinguished three types of acetabulum, which he designates as Types A, B and C. Type A, in which the shadow of the roof approximated the horizontal, was seen in 57 per cent of the males and 35 per cent of the females. Type B, in which the line of the roof was more inclined yet formed an obtuse angle with the lateral side of the ala of the ilium, was seen in 37 per cent of the males and 45 per cent of the females. Type C, in which the line of the roof was so inclined as to be almost a continuation of the lateral side of the ala of the ilium, forming only a very slight angle, was seen in 25 per cent of the males and 15 per cent of the females. While the importance of the degree of obliquity is relative, it seems that the more oblique the line of the roof the greater the likelihood of dislocation. The greater frequency of the more oblique roof in the female is in accord with the greater incidence of congenital dislocation in the female. The changes described may be noted at birth.

2. Retardation of the appearance and hypoplasia of the femoral epiphysis. These signs may be detected only after from three to four months of life. However, they are easily detected. As an example of such changes Putti cites the so-called obstetrical trauma of the shoulder in which there is deformation of the glenoid cavity with hypoplasia of the humeral epiphysis. If this may be compared with the hip joint the likelihood of a traumatic cause for the dislocation is more probable.

3. Ectopic position of the upper end of the femur. In the normal, a horizontal line along the upper ends of the femora passes through the inferior quadrants of the acetabula and the vertical line extended upward from the inner edge of the femur bisects the roof of the acetabulum. Variations may be noted by the twentieth day.

A. LOUIS ROW, M.D.

Radulesco A. D. and Susan, B. Periosteal Dysplasia (Sur la dysplasie périostale) *Rev d'orthop* 1932 xl, 5

According to Policard the normal growth of bone both in length and width is dependent entirely on the periosteum and the epiphyseal cartilages have nothing to do with it. In support of this theory are the facts that some vertebrates have no epiphyseal cartilage yet their bones grow in length and some bones such as the clavicle and the cranial bones, develop from connective tissue only.

Periosteal dysplasia is characterized by brittleness of the bones and frequent fractures before as well as after birth. As maturity is approached, the symptoms disappear. The condition was first described by Eckmann in 1788. In 1849 Vrolik designated it by the term 'osteogenesis imperfecta'. In 1895 Lobstein called it 'osteopathia thyroidea', and eight years later Gurlt referred to it as 'fragilitas osium'. The authors suggest calling it periosteal dysplasia until its cause is known definitely.

In many cases heredity has been recognized as a definite factor in the development of the condition. Absence or poor function of the osteoblasts has been assumed to be a cause. By some the condition has been attributed to poor circulation in the marrow, chronic alcoholism in the parents, or syphilis but the cases cited in support of these theories have been few. Observations made with regard to endocrine disturbances have led to no definite conclusions.

Infants with the intra uterine form of the disease are usually stillborn or born prematurely. In those who live there are evidences of malnutrition. The eyes and chin are prominent, the nose is thin and the skull is increased in the biparietal diameter. The postnatal form of the condition is often not recognized until fractures occur which may be as early as the eighteenth month of life. The frequency of fractures diminishes as the child grows older. While the condition may involve any bone, it affects most frequently the femur and leg bones. The symptoms and displacement associated with the fractures are never so pronounced as those of fractures of normal bones. There may be very little pain and swelling. In a case reported by Porak and Durante 550 fractures occurred. Many of the fractures may be slight and demonstrable only by roentgen ray examination. The gray blue color of the sclerae of children with periosteal dysplasia may be due to the color of the choroid pigment showing through an abnormally transparent sclerotic coat. When fractures are so frequent that the child is kept off of his feet for a long time, the bones become osteoporotic and may present the picture of osteomalacia. The osteoporosis favors still more frequent fractures and deformities. Callus formation is always slow and at the site of fracture a zone of decalcification may persist for a long time.

The long bones are usually increased in diameter the medullary canal being wider than normal with relation to the cortex. The short bones also show

thinning of the cortex. Ossification of the vertebrae is usually much delayed and the pelvis is sometimes deformed. In many cases arteriosclerosis is found. In the case of a baby three months old which was reported by Johansen, death resulted from cerebral apoplexy.

Microscopic examination shows the periosteum to contain more fibrous tissue and fewer osteoblasts than normal.

No treatment has been found of definite value. Dietary treatment and the administration of cod liver oil and gland extracts have been tried. The fractures heal if they are given as much care as fractures of normal bones.

The authors report 3 cases. The first was that of a premature infant which had 9 fractures and died after a few days. The second was that of a child of five years who had 2 fractures in 1 femur, 1 fracture in the other femur and a fracture of the radius and ulna, which occurred at different times during a period of two years. The third case was that of an eight year-old child with a history of similar trouble in antecedents who sustained a fracture of 1 femur and 1 tibia from slight trauma and presented osteoporosis of the entire skeleton.

WILLIAM ARTHUR CLARK, M.D.

Magnuson P. B. The Simplification of the Treatment of Fractures. *Surg., Gynec. & Obst.* 1933 lvi 483

In the treatment of fractures one must obtain first a mental picture of the attachments of the muscles, the strength of the muscles, the angle at which the muscles pull, and the displacing effect of the muscles on the fracture and must next consider thoroughly the apparatus necessary for reduction and retention of the fracture. The treatment of fractures is based on one principle—traction balanced by countertraction. As a rule traction is obtained best by the application of adhesive plaster to the skin in three-tailed strips. Efforts at reduction should be slow steady and prolonged. If conservative measures are unsuccessful, operative treatment should be given immediately.

Transverse fractures of the arm may be reduced by means of a heavy muslin bandage looped around the patient's wrist or elbow and passed over the surgeon's shoulder the patient being secured to the table by a bandage placed around the chest under the axilla. The surgeon obtains counter traction by pressing his foot against the table.

In fractures of the leg traction may be applied by placing a Collins hitch around the ankle, tying the ends of the hitch through the eye of a double pulley fastened under the sole of the foot, and joining this pulley with a piece of rope to a double pulley attached to the foot of the table. Counter traction may be obtained by passing a sheet between the patient's thighs and tying it to the head of the table.

In cases of fracture of the leg or arm, traction must be maintained while the cast is applied with

the limb in the horizontal position. In order to prevent angulation, support must be applied above and below and at the point of fracture. When a cast is applied for fracture of the forearm, traction may be made by placing loops around the fingers and attaching these loops to an overhead support.

In fractures of the ankle inversion may be obtained by placing a few turns of plaster bandage around the ankle over a heavy felt pad and bringing the plaster down over the ankle on the outside of the foot, under the sole and up toward the knee on the inner side. An assistant grips the bandage roll in one hand and, while supporting the leg with the other, maintains the knee in right angle flexion supported against his chest.

In fractures in or near the knee joint the cast may be applied with the leg in full abduction. This makes it possible to bring the cast up into the gluteal fold and against the ischium.

In fractures of the surgical neck of the humerus, traction should be started with the arm in abduction of about 20 degrees, and the elbow should be gradually brought forward as the arm is abducted.

In fractures of the lower end of the humerus there is a tendency for the muscles attached to the lower end to displace the fragments in different directions. Traction is by far the most satisfactory method of reduction.

Fractures of the olecranon always require open reduction if the fragments are separated and the ligaments are torn. After operation, immobilization is unnecessary. Motion can be started within

twenty four hours, and union should be complete after from four to six weeks.

The reduction of fractures of the forearm is best maintained by steady continuous traction. This may be obtained by means of an adhesive plaster cuff placed around the wrist and fixed to horizontal strips of wood at the metacarpophalangeal joints. Countertraction may be obtained by placing a sand bag across the lower end of the humerus just above the elbow. Rotation of the radius is controlled by attaching a rope to the horizontal crossbars. After alignment is obtained, double board splints may be applied to the flexor and extensor surfaces.

In fractures of the radius without fracture of the ulna, complete restoration of function requires restoration of the normal length of the radius. The author supports the joint by placing thick felt pads laterally over the radius and ulna, allowing each of them to fold around the flexor and extensor surfaces. He then forces the pads toward each other by including them in a tightly strapped circular band of adhesive plaster.

The deformity of Colles' fracture is backward and upward displacement of the lower fragment of the radius which produces a double bend in the flexor tendons. Reduction is obtained by first breaking up the impaction and then applying traction at the base of the hand by means of a bandage loop extending from the hand over the operator's shoulder. In elderly persons there may be disintegration of cancellous bone cells resulting in deformity of the wrist. RICHARD S. RICE, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Pistocchi, G.: Knowledge Regarding the Carotid Sinus (Esperienze sul seno carotideo) *Arch. Ital. di chir.* 1933, xxiii, 60.

The experimental studies reported in this article were suggested by the observation of marked rapid alterations in the rate and type of the pulse and in the blood pressure occurring in the course of an operation for the removal of a neoplastic gland in the left side of the neck. The author presents a brief review of the literature on the carotid sinus up to the time of Hering. The importance of the carotid sinus in surgery is evidenced by the vasomotor phenomena produced by pressure upon the sinus: the disturbances arising in it in surgery of the neck including thyroidectomy, and the effect upon it produced by pressure on the mandible during general anesthesia.

In animals under ether or chloroform anesthesia electrical stimulation of the carotid sinus resulted in a rather sharp drop in the blood pressure and a diminution of the heart rate which occurred in the fairly constant relationship of an eight to twelve drop in the rate to a 25-mm. drop in the pressure. After the injection of large amounts of adrenalin the sinus seemed to be relatively inexcitable. In animals subjected to thyroid parathyroidectomy four days previously stimulation of the sinus caused immediate severe convulsions which stopped when the current was stopped. The effect on the heart rate and blood pressure in these animals was slower and less marked than in normal animals. In animals in which hyperthyroidism had been produced by feeding dried thyroid substance, stimulation of the sinus resulted in a sudden drop in the pulse rate and blood pressure which was more rapid and profound than in normal animals. After prolonged stimulation the pulse became approximately normal, but the blood pressure remained low.

The author suggests that hyperexcitability of the carotid sinus may explain some of the sudden deaths during thyroidectomy.

The cause of phenomena discussed has not been determined with certainty, but is probably a reflex action through the medullary centers acting upon the capillaries.

A. Louis Ross, M.D.

Moszkowicz, L.: Surgical Occlusion Treatment of Varicose Veins (Chirurgische Verödungsbehandlung der Krampfadern) *Zentralbl. f. Chir.*, 1933, p. 2755.

In spite of the fact that in the last few years the injection method of treating varicose veins has been gradually replacing the surgical method there are still a number of cases in which injection is not suitable. According to the author it is particularly the

widely dilated venous plexus with many anastomoses to the deep veins which resists the injection treatment. For these Moszkowicz recommends the combination of vein resection and obliteration treatment which he proposed in 1927. This treatment has the great advantage that it can be carried out on ambulatory patients. The old Trendelenburg ligation of the saphenous vein at its entrance into the femoral vein which has a mortality of 1 per cent is not performed. Instead the dilated veins themselves are ligated centrally and are obliterated in their peripheral parts by an injection of from 10 to 40 c.c.m. of glucose solution.

In the course of five years 400 limbs were treated by this method with good results. As recurrences occasionally developed, the author modified the technique to include the ligation of as many of the branches of the varicose vein as possible. Through a 4 or 5-cm. incision a segment of vein twice its length is resected. In order to prevent thrombosis central to the proximal ligation the central end of the vein is not pulled out. It is isolated very carefully and without dissection and the ligation is carefully placed around it with an anatomical forceps. Since the adoption of this careful treatment of the adventitia and intima central thrombosis has no longer been observed. The peripheral end of the vein can be handled more firmly. By ligation of all of the branches as long a segment of vein as possible is freed. At the lower end it is incised and from 30 to 40 c.c.m. of glucose solution are injected through a blunt cannula. The resection is then carried distal ward as far as possible. When there is a long varicose vein of the thigh with a deep branch from the plexus at the knee the vein is ligated above and again at the upper part of the knee. It is then resected and the glucose solution injected. Even after such a double procedure the patient can go home directly. Patients engaged in heavy labor are obliged to interrupt their work for only eight or ten days. They should not lie in bed but should walk around quietly in the room because stagnation of blood favors thrombosis and embolism.

The ambulatory treatment replaces completely the old extensive resections and cures even severe cases. Operative treatment seems indicated only for tumor like dilatations of the veins, chronic recurrent thrombophlebitis and patients who refuse the injection method.

SALOMON (Z)

Mason, J. M.: Extreme Cardiac Decompensation Following a Traumatic Arteriovenous Fistula of the Left Subclavian Vessels. *Am. J. Surg.*, 1933, xx, 451.

It has been definitely established that, in addition to local and peripheral symptoms arteriovenous

aneurisms of the larger blood vessels are often associated with pronounced cardiovascular changes.

The latter may include dilatation and hypertrophy of the heart, acceleration of the pulse, a low diastolic pressure, a high pulse pressure, a fall in the pulse rate and a rise in the blood pressure following temporary occlusion of the fistula, cardiac murmurs, dilatation of the artery proximal to the fistula, and a condition simulating aortic insufficiency.

According to Matias, the cardiovascular effects are determined or influenced by (1) the size of the fistula, (2) the volume and force of the arterial stream that is shortcircuited into the communicating vein, (3) the caliber of the vessels involved, (4) the proximity of the involved vessels to the heart and (5) antecedent cardiovascular disease.

The author reports the case of a woman who developed an arteriovenous fistula between the left subclavian artery and vein as the result of a stab wound in the left chest. The extreme degree of cardiac decompensation which rapidly followed the formation of the fistula was arrested by ligation and excision of the vessels entering into the formation of the fistula. Following ligation of the subclavian artery in its first and third portions, ligation of the subclavian, internal jugular and left innominate veins, and excision of the included sections of these vessels together with the fistula, the signs of broken compensation disappeared, the quality of the pulse improved, and the blood pressure rose to a more normal level. The patient has been able to resume her household duties and is steadily improving. The heart, though well compensating, has sustained damage which will probably be permanent.

Fifty-nine collected cases of arteriovenous aneurisms of the subclavian vessels are reviewed. Of the twenty-seven cases which were treated surgically a cure was obtained in twenty, improvement in two, and no improvement in two. Three of the surgically treated patients died, the mortality being therefore 11.1 per cent. Of the thirty-two cases in which operation was not performed, a spontaneous cure occurred in two and death in 2 (6.2 per cent). The incidence of improvement and lack of improvement in the others could not be ascertained.

NORMAN C. BULLOCK, M.D.

BLOOD; TRANSFUSION

Benhamou, E., and Nouchy, A.: Massive Auto-Agglutination of the Erythrocytes Preceded and Followed by Massive Auto-Agglutination of the Platelets (*Grande auto-agglutination des hématies précède et suit de grande auto-agglutination des plaquettes*). *Presse Méd.* Par 913, XII, 25.

Massive auto-agglutination of the erythrocytes is rare. Recently Aubertin, Rist, and Debenedetti have reported cases and reviewed the literature.

The authors report a case in which there occurred not only a massive auto-agglutination of the erythrocytes, but also a massive auto-agglutination of the

platelets. The patient was a woman thirty years of age who was admitted to the hospital for treatment of a painful splenomegaly. Her family history was negative. She had had febrile attacks during infancy, but no recent attack of malaria and no other infectious diseases. She had borne two children and was in good health until two years before her admission to the hospital, when her spleen began to enlarge with increasing pain and she became very anemic and pale.

The anemia grew worse, the number of platelets remained low, the spleen became more painful and showed no reaction to adrenalin, and prolonged treatment with quinine proved useless. Splenectomy was therefore done. Fifteen days after the operation the patient developed an acute recurrence of malaria. Such recurrences are known to occur after splenectomy. Examination of the blood revealed plasmodium vivax, and as the urea index remained below 0.50 the febrile attacks were permitted to develop. At first the attacks of fever occurred with increasing frequency but then began to subside. As auto-agglutination of the erythrocytes took place after the beginning of improvement and the establishment of spontaneous immunity tolerance, massive auto-agglutination of the erythrocytes can not be considered of prognostic value.

This case was the first in which the authors observed a massive auto-agglutination of the platelets. Agglutination is a natural property of the platelets, but in the diluting fluids commonly employed (Van Hensendon solution, Achard and Aymard solution) the platelets remain separate and can be counted. While the occurrence of auto-agglutination of the platelets was not mentioned in previous reports of cases of massive auto-agglutination of the erythrocytes, the authors believe it is the rule in such cases. However, they call attention to the fact that in the case they report the agglutinins of the blood affected the platelets before they affected the erythrocytes and at a time when the erythrocytes could still be counted. Sufficient agglutinins remained in the blood to hinder the count of the erythrocytes for several days.

Auto-agglutination of the erythrocytes has been observed in three large disease groups: (1) the cirrhoses, (2) acquired hemolytic jaundice, and (3) the trypanosomiasis. The authors case shows that it may render a count of the erythrocytes impossible also in malaria. The diversity of conditions in which it may occur robe it of diagnostic value.

By some, massive auto-agglutination of the erythrocytes has been regarded as indicating a poor prognosis. However, others have noted the phenomenon in conditions of no serious import, such as senile pruritus, chlorosis, and chronic bronchitis.

Temperature plays an important rôle in the production of the phenomenon of auto-agglutination of the erythrocytes. The agglutination is very marked at a temperature between 12 and 14 degrees C. and persists at 37 degrees, but disappears at a temperature between 40 and 45 degrees. Therefore in cases

of massive auto-agglutination of the erythrocytes, one needs only to heat the specimen in order to be able to count the erythrocytes. Yorke insisted on the reversibility of the phenomenon of agglutination claiming that it disappeared at 37 degrees and reappeared at 0 degrees. In the authors case the auto-agglutination of the erythrocytes after having disappeared at 45 degrees, did not reappear at 12 degrees. A fact showing that agglutinins are always present in the plasma was that, even by raising the temperature to 55 degrees, it was found impossible to make the massive auto-agglutination of the platelets disappear.

Auto-agglutination of the erythrocytes is not always associated with extreme anemia.

A search for hemolysins in the authors case was negative.

Splenectomy does not seem to play a part in the production of the phenomenon, as Sato reports a case in which auto-agglutination disappeared after splenectomy.

In the interpretation of the phenomenon of agglutination two factors which appear related to each

other seem of significance, viz. (1) disequilibrium of the blood albumins with lowering of the serum albumin (from 35 to 18 mgm per 100 c.cm) and of the ratio of serum albumin to serum globulin (from 1 to 0.50) and (2) a positive formol fixation reaction at the end of two hours. It is well known that such a disequilibrium of the albumins and formol fixation of the serum occur in the trypanosomiasis in which auto-agglutination of the erythrocytes is common. Accordingly the suggestion is made that the latter like the two other phenomena, is a reaction to infection.

Massive auto-agglutination of the erythrocytes and of the platelets presents a problem of immediate practical interest when blood transfusion is considered. In Aubertin's case, the serum of the patient agglutinated the erythrocytes of different blood groups, rendering transfusion impossible. In the authors case the serum of the patient did not agglutinate the erythrocytes of the various blood groups. The patient belonged to Group III and therefore could be transfused safely with blood belonging to Group III or IV.

EDITH S. MOORE.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Demel, R.: *The More Conservative Endavors in Modern Surgery* (Schonendere Bestrebungen in der modernen Chirurgie) *Wien. M. Wochenschr.* 1933 n, 309

In recent times attempts are being made to replace the more or less radical methods of surgery with *more conservative procedures*. The author cites numerous examples.

Even in the choice of the anesthetic, not only is the organism spared as much as possible, but even the psyche of the patient is taken into consideration. This explains the frequent choice of nitrous oxide anesthesia when for any reason local anesthesia cannot be used. In cases in which nitrous oxide alone is not sufficient to induce anesthesia of sufficient depth the otherwise necessary addition of ether is avoided by supplementing the nitrous oxide anesthesia with local anesthesia.

In order to decrease the unfavorable effects of operations, pre-operative blood transfusions are given to anemic and weakened patients and also to patients who are to be subjected to an operation which will cause a large loss of blood.

In the field of malignant tumors operation is now often avoided by the use of radium and roentgen irradiation. This is true in cases of carcinoma of the skin, lips, tongue, larynx, and tonsils.

In the surgery of Basedow's disease the results have been improved by giving the patient pre-operative treatment with Lugol's solution, as recommended by Plummer.

In the surgery of brain tumors a conservative procedure of another sort was elaborated by Cushing. Cushing observed that many brain tumors grow very slowly and remain enclosed in their capsule for a long time. Therefore he does not insist upon the complete removal of such tumors, but undertakes their extirpation gradually and under certain conditions does not hesitate to leave portions of the tumor or its capsule behind.

In the treatment of trigeminal neuralgia the injection of alcohol seems to be associated with less immediate danger and a much lower mortality than extirpation of the gasserian ganglion, which has a mortality of 11 per cent even when done by Krause.

Also in the treatment of furuncle and carbuncle conservative treatment is acquiring more adherents. Operation is regarded as indicated only in cases with increasing infiltration into adjacent tissues and aggravation of the general condition.

In the operative treatment of empyema of the pleura, radical methods are being discarded in favor of more conservative procedures (closed drainage)

In esophageal stenosis of the esophagus the antithoracic esophagoplasty has almost never been carried out since Lothelissen was able to show by means of the Berlin-blue reaction that a large number of the stenoses considered impermeable were permeable and could be dilated much more conservatively and with less danger by means of bougies.

In biliary surgery it appears that cholecystostomy and the *ideal cholecystotomy* are being performed more frequently than formerly instead of cholecystectomy.

The high mortality of the surgical treatment of acute pancreatitis has in recent times led to expectant treatment. Moreover in operating upon cases of acute pancreatitis the surgeon has become more conservative insofar as incision into the capsule or even into the parenchyma of the pancreas has been discontinued because of the danger of hemorrhage and secondary hemorrhage.

The fact that in pneumococcus peritonitis it is impossible to eliminate the source of the infection has also led to conservative treatment, in contrast to the treatment of the other forms of peritonitis.

In enteroptosis the limitation of operative procedures in recent times has been especially marked.

The operations for chronic obstipation, which are associated with a high mortality have also been disappointing and have given way to more conservative treatment.

In tuberculous of the testis and the epididymis semicastration is not done as often as formerly.

Of the numerous operative procedures for the treatment of varicocele, the majority have lost considerably in importance.

In the treatment of varicosities of the lower extremities, operative treatment has become limited more and more and in its place injection treatment has been given wider application.

In the various diseases and injuries of the bones and joints conservative treatment has become increasingly popular. The older chiefly operative treatment of tuberculosis of the bones and joints has been considerably limited and has been replaced by heliotherapy.

Also in the treatment of fractures there is noticeable an increasing limitation of the open methods of treatment. This is due to the improved procedures of extension treatment and the better primary reposition of fragments obtained by means of new apparatus.

In some pseudarthroses bony consolidation can be obtained by the boring method of Beck with avoidance of a major operation.

The use of the permanent water bed in surgical diseases is a great advantage, as decubitus and enter-

sive phlegmonous processes frequently heal without operation when such a bed is used. Aside from the fact that some intestinal fistulae close spontaneously under the influence of the water bed, operative closure of intestinal fistulae is less dangerous after the use of the water bed than operative closure without previous use of the water bed.

The author shows that the problem of modern surgery consists not only in opening up new fields of operative surgery but also in aiming to use more conservative procedures. *M. HIRSCH (7)*

Gucci, G. The Behavior of the Blood Platelets in Certain Surgical Conditions (*Il comportamento delle piastrine in alcune malattie chirurgiche*) *Pedidia*, Rome, 1933, XI, 125, *chir.* 141.

Although the blood platelets were first described as long ago as 1844, relatively few studies have been made of them. As their number varies considerably under normal conditions, their variations under pathological conditions are difficult to evaluate. A study of them is rendered difficult also because they are fragile and difficult to stain and they agglutinate readily.

The author reports studies of the platelets which he made in various acute and chronic infections, traumatic lesions, and tumors and in experiments on guinea pigs and rabbits. The platelets were increased in infections but decreased in severe sepsis. In general, their curve followed that of the leucocytes, but when an infection became worse the platelets decreased.

Gucci concludes that the platelet curve is an accurate index of the prognosis in many surgical conditions. *ROBERT T. LEVINE, M.D.*

Kirschner: The Transplantation of Epidermis (*Ueber Epidermisverpflanzung*) *Acta chirurg. Scand.*, 1932, LXIII, 21.

In the transplantation of epidermis it is better for cosmetic reasons to use one large flap than several smaller pieces. In the use of Thiersch grafts there is a constantly increasing demand for greater thickness, length and width of the grafts.

The author's epidermis elevator is a modification of the Schepelmann scalpel. The modification consisted in diminishing the angle of the scalpel to the skin surface. To stretch the skin of the thigh in a transverse direction successfully Kirschner has devised an apparatus with which the stretched skin forms a wide plane and the point of attack on the skin lies below rather than above its normal level so that the cutting process is not hindered.

At a distance of from 10 to 15 cm. apart which is somewhat wider than the proposed skin flap, two steel rods with sharp points and removable handles are bored under the skin of the thigh in a distal to proximal direction so that the ends protrude from the skin (Fig. 1). The knee is flexed and hangs over the edge of the table. On their sides the rods have slits into which fit the ends of four curved steel bridges about 10 cm. long. Two of these bridges with



Fig. 1. Introduction of the steel rods to stretch the skin for the removal of Thiersch flaps.

chains attached are fitted to the rods as shown in Fig. 2 and the skin between the rods is markedly stretched by pulling on the chains. Thiersch grafts of any length, width and thickness may then be cut. For the taking of homoplastic grafts from recently amputated extremities the author has devised a board (Fig. 3) which is based on the same principle of skin tension and fixation.

The skin should be rubbed with physiological salt solution but as the danger of infection is not great no disinfectant should be applied to it.

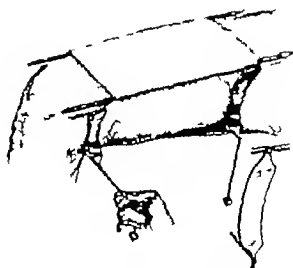


Fig. 2. Application of the steel bridges and chains to stretch the skin for the removal of Thiersch flaps.

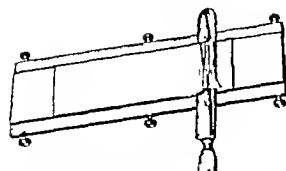


Fig 3. Board to stretch the removed skin for the removal of Thiersch flaps.

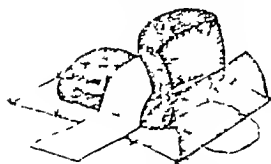


Fig 4. Rubber sponge pressure dressing for Thiersch transplants.

The less the friction with which the scalpel glides over the skin the easier the flaps are cut. For moistening olive oil is preferable to physiological salt solution as it prevents drying of the transplant.

The cutting of the epidermal flaps should be the last act of the operation. The area to be grafted should be prepared first and the epidermal flaps then applied immediately.

There should be absolute hemostasis of the part treated. An excellent procedure for this purpose is electrocoagulation with a diathermy knife or needle. If this fails, the Thiersch flaps should be perforated.

An excellent dressing for the wound is Sirfis gauze fastened in place at the edges of the transplanted surface with mastisol and sutured to the skin edges by a few stitches. This prevents displacement of the transplant. The gauze should be removed after from eight to ten days. Later the Thiersch graft may be painted with zinc oil.

To prevent the accumulation of blood and tissue juices under the graft, elastic pressure should be maintained by means of a rubber sponge that has been boiled in physiological saline solution and squeezed into dry towels. This should be applied to the gauze-covered transplant with elastoplast under slight tension. (Fig 4) LOUIS KAWWAZ M.D.

Hunt E. L.: Postoperative Thrombosis and Embolism. *New Engl J Med.*, 1933, cxviii, 730

The author reviews the cases of thrombosis and embolism which occurred in the City Hospital of Worcester, Massachusetts, in the past twelve years.

Of the total number of deaths during this period, 0.9 per cent were from pulmonary embolism.

Of the patients operated on 0.43 per cent developed thrombotic complications and 0.11 per cent died of pulmonary embolism.

Of the total of 137 cases of thrombosis, 43 were medical cases and the remainder were surgical, obstetrical, or traumatic.

Influenza epidemics had no definite influence on the incidence of thrombosis although the yearly incidence of the condition was quite variable. Twice as many females as males were affected. The greatest number of thromboses occurred after abdominal operations.

The number of infections associated with thrombosis was surprisingly low.

Precautions which may tend to decrease the danger of the liberation of clot-producing substances and hence the danger of thrombosis and embolism are:

1. The avoidance of trauma to the deep epigastric vessels in making upper or lower rectus incisions.
2. The control of bleeding by isolated ligation rather than over-and-over suture, and care to avoid transection of veins when work is being done in the vicinity of the broad ligament.
3. The avoidance of trauma to vessels (especially the vena cava) by deep retractor blades.
4. Careful ligation of all veins to prevent thrombogenic tissue juices from entering them and starting a clot.
5. Careful suturing of the tissues with minimal burying of suture material.
6. Proximal ligation as the first step in operations on varicose veins.

Among the factors of importance in the causation of thrombosis are:

1. An increased tendency toward blood clotting.
2. Blood stasis from slowing of the stream, depressed circulation, or lowered metabolism.
3. The influence of cardiovascular diseases.
4. Infection.

A high protein diet increases the clotting power of the blood. In most cases of thrombosis the clotting index is high. Sodium thiocyanate solution given intravenously has a restraining effect upon the elevation of the index and has been used to prevent thrombosis.

The prevention of blood stasis by the avoidance of overextension of the legs in the Trendelenburg position, by systematic exercises of the legs after operation, and by the avoidance of tight binders and dressings will aid in decreasing the incidence of thrombosis. Thyroid extract has been given to increase the circulation.

Wound infections do not occur in all cases of thrombosis, but organisms are present in every operative wound even when no gross evidence of infec-

tion is present. Such "occult" infections may account for certain processes remote from the wound, of which thromboses may be an example.

In 1927 Rosenow reported the isolation of a diplo-streptococcus from emboli in 6 cases of fatal pulmonary embolism. Pure cultures of this organism injected into dogs and rabbits produced thromboses and in 2 dogs caused pulmonary emboli.

From a study of the cases on which this discussion is based it is apparent that while embolism cannot be wholly prevented there is hope of decreasing its frequency and avoiding a fatal outcome by greater alertness with regard to the premonitory signs and the efficient use of such methods of control as are now available.

It is most important to recognize peripheral thrombosis as soon as it occurs. Routine measurements and examinations should be carried out before the patient is allowed to get out of bed to be certain that thrombosis has not been overlooked.

The treatment of thromboses has been rest and quiet—a period of at least six weeks of complete rest with special nursing care to prevent movement. A diet with a low residue should be given to decrease the use of the bedpan. The leg should be rested on a pillow and covered by a cage containing electric bulbs for warmth. A sudden decrease in the swelling and improvement in the color are to be regarded with suspicion as they may mean that the clot has become loosened and is on its way to the heart.

In an embolic crisis the patient is quieted with morphine and given oxygen. Sodium thiosulphate has been used and deserves a wider trial.

The Trendelenburg operation is mentioned as a heroic measure for which one should always be prepared in the last moments of an otherwise fatal embolism.

MARY E. MATHER, M.D.

Coryllos, P. N.: The Etiology Prevention and Treatment of Postoperative Haemorespiratory Complications in the Surgical Treatment of Tuberculosis. Endotracheal Anesthesia Combined with Bronchial Suction (84 Cases, 152 Operations) *J Thoracic Surg* 1933 II 384.

In a search for an explanation of the complications which frequently follow operations on the chest, the author reviewed the various theories that have been advanced but found them somewhat inadequate.

He discusses the pathological physiology of the lung and reports clinical and experimental findings based on 250 thoracoplastic operations performed on 133 tuberculous patients in 2 institutions in New York City which provide 2,000 beds for tuberculous patients.

The complications are shown to be the result of respiratory and circulatory deficiencies which produce an acute or prolonged deficiency of oxygen and carbon dioxide and lead to an anoxicemic crisis and to death if steps are not taken to prevent it.

These deficiencies are the result of stasis of the bronchial secretions which are always present in the lung before operation, and especially of the secre-

tions expressed during the operation by the collapse of the diseased lung.

A pneumococcus, which is practically always present in the upper respiratory tract, infects the bronchial exudate increasing its viscosity and rendering it able to obstruct large as well as small bronchi.

The anoxemia is increased by a further decrease of the respiratory area by foibular lobar or massive atelectasis, the collapse of the thoracoplasty itself or the development of areas of bronchopneumonia. The result is a rapid shallow respiration which again adds to the anoxemia and causes a massive elimination of the carbon dioxide producing acapnia. The acapnia further increases the anoxemia and brings about a loss of muscular tonus which leads to peripheral vascular failure peripheral circulatory stasis a decrease in the venous return to the heart, a fall in the blood pressure—the picture of shock and an anoxicemic crisis.

Deaths which have been attributed to heart failure cardiac dilatation, shock, or aspiration or tuberculous pneumonia have been found in the last analysis to have been due to such an anoxicemic crisis.

The treatment and prevention of these complications can be directed only at the origin of this chain of events namely the stasis and infection of the bronchial secretions present in the lung especially in the diseased portion which is to be collapsed. As the vicious circle begins during the operation, the author has developed a method of inducing anaesthesia which tends to eliminate the factors leading to anoxemia. This consists of endotracheal insufflation anaesthesia combined with bronchial suction. Such an anaesthesia with the use of the author's special endotracheal tube introduced through a bronchoscope under local anaesthesia before the operation keeps the respiratory ways patent cuts off the communication between the upper and lower respiratory tracts, thus preventing the aspiration of infected material keeps the lung adequately ventilated thereby preventing acapnia and allows repeated suction to eliminate bronchial secretions before, during and after the operation.

The author compares 152 operations performed with intratracheal anaesthesia and 98 operations performed with the ordinary mask anaesthesia. The results so far have proved that the working hypothesis on which the author's study was based is sound as they have shown a definite increase in the number of good results and a similar decrease in the mortality following thoracoplastic operations.

MARY E. MATHER, M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

Sirolli M. The Pathology of Death from Electricity (*Sulla patologia della morte da elettricità*) *Arch Ital di chir.*, 1933 xxxiii 333

The author reviews the literature on the pathology of death from electricity and reports the results of

an experimental study of the effects of varying amounts of electricity on rabbits.

The major portion of the report deals with the anatomical and histological changes. Necropsy usually revealed no characteristic changes. Frequent findings, however, were a more or less generalized congestion with some hemorrhage, especially in the brain, liver and kidneys. The blood tended to be more liquid than usual and dark and there was usually some coagulation in the right heart. In general, the changes conformed to those found in human beings. The findings of histological studies of the organs were briefly as follows:

In the heart, fragmentation of the myocardium was almost constant and plication and undulation of the fibers, irregular vacuolization of the protoplasm, and zones of edema and interstitial hemorrhages like those seen after death from asphyxia were common.

In the lungs, an emphysematous state was very evident. This was accompanied by hemorrhagic foci, congestion, rupture of blood vessels, contraction of the bronchioles, multiple emboli, acute rupture of the alveolar walls, and some desquamation of the bronchial mucosa.

Common findings in the liver included changes due to venous stasis and parenchymal damage, dilatation of the central lobular veins, laceration of the parenchyma with foci of infiltration and hemorrhage changes in the cell outlines with some granulation basophilia, and vacuolization, especially in the region of the central veins and some separation of the mucosa of the biliary ducts.

In the pancreas, the common findings were vacuolization and swelling of the cellular protoplasm with changes in the staining qualities of the nuclei and more or less diffuse foci of necrosis, multiple hemorrhagic areas with constriction of the arteries, and desquamation of the ductal mucosa. No changes were found in the islet tissue.

In the kidneys, the changes were so variable that a generalization is impossible. Common findings included distention of the glomeruli due to accumulated blood. Occasionally this was associated with rupture of the intracapsular capillaries and hemorrhage although in some instances the glomeruli were markedly contracted. Other common findings were distention of the blood vessels and rupture with hemorrhage into the cortex and medulla. Swelling and desquamation of the tubular epithelium were also noted.

The spleen was usually contracted and showed retraction of the connective tissue septa, fragmentation and dissociation of the splenic tissue, and scattered areas of hemorrhage.

In the thymus, areas of hemorrhage into the pulp and some distention of the veins were found but a condition simulating that of status thymicolympathicus was not seen.

The skeletal muscles showed fragmentation a tortuous and somewhat vorticoso arrangement of the fibers, loss of striation, vacuolization, and some

separation of the contractile substance from the sarcolemma.

In the central nervous system the changes were extremely variable. They were most constant in the cerebral cortex. The cell bodies were sometimes difficult to identify because of fragmentation, pulverization, or granulation of the protoplasm and reduction in the size of the cell. The surfaces of cells which remained more or less intact were marked by a laceration, notch or erosion. In the nuclei, chromatolysis and vacuolization were extremely variable. They were most constant in the cerebellar cortex and pons. The nuclei showed retraction and reduction in size and were often displaced and vacuolated, especially in the basal ganglia, the floor of the fourth ventricle and the cerebellum. The nerve cell processes were often wavy, fragmented, and spirillar. The changes in the blood vessels were similar to those in the other organs. They included congestion, ecchymoses, and infarcts.

Changes in function following a non-fatal shock were studied with special reference to the liver and kidneys. Fractional shocks were found to produce grave inhibition of the renal function with anuria frequently continuing for three days, an increase in the cholesterol content of the liver, an enormous increase in the lactic acid content of the blood, and marked retention of nitrogenous end-products such as urea and amino acids.

Hematological studies after fractional shocks revealed an increase in the number of circulating erythrocytes, variations in the number of leucocytes, which at times were increased and at other times decreased, a constant increase in the lymphocytes and monocytes, a slight increase in the viscosity and coagulation time, and an increase in the resistance of the erythrocytes.

Extracts of organs of electrocuted animals were found to be more toxic than those of the organs of normal animals and in some instances acted in a peculiarly specific manner. Extracts of lung, for example, causing death with marked pulmonary edema and extracts of kidney causing death with marked renal changes and anuria.

In general, the electricity caused regressive changes of varied grades in the cells of all organs and when the shock was protracted or intense it produced a more or less grave necrosis.

A. LOUIS ROW, M.D.

RUSEMAN D. FOX, W. W. ALPERT, B. J., and COOPER, D. A. Hydropneumothorax: Report of Two Fatal Cases, with Pathological Studies in One. *Arch. Int. Med.* 1933 44: 643.

In the first of the two fatal cases of hydropneumothorax reported by the authors the treatment consisted of cauterization with fuming nitric acid. Symptoms of rabies developed after twenty-six days and death occurred three days later. In the second case the wound was cauterized with phenol and a full course of Pasteur prophylactic treatment was given, but symptoms of rabies developed after three weeks and

death occurred four days later. Autopsy in this case disclosed the characteristic lesions of rabies encephalitis, namely inflammatory changes in the gray matter at the base of the brain, particularly in the colliculi, the periaqueductal gray matter, the substantia nigra, and the tegmentum of the pons and medulla. The inflammation had spread to the spinal cord.

The treatment recommended is thorough cauterization with fuming nitric acid followed by a course of Pasteur Immunization. In cases of bites about the face and hands the immunization should be rapid as immunity is not developed until fourteen days after completion of the treatment.

MAURICE L. DALE, M.D.

ANÆSTHESIA

Field W. H. and Pilcher L. S.: II: Avertin Anæsthesia. *Ann Surg* 1933 xcvi, 577

Four hundred and thirty-one surgical cases in which anæsthesia was induced with avertin were compared with a like number in which operation

was performed under anæsthesia induced with some other anæsthetic. The preparation in the former was avertin fluid. This was used as a basal anæsthetic only. The dosage varied from 60 to 100 mgm. per kilogram of body weight. The advantages of the use of avertin are the avoidance of pre-operative fear, the ease of induction of narcosis, reduction of the amount of general anæsthetic necessary and reduction of postoperative distress. The disadvantages are the time and trouble necessary to prepare the solution freshly each time, the length and variability of the induction period, lack of control of the anæsthetic after the solution has been given, prolonged special nursing after the operation, slow excretion of the drug through the kidneys, the wide variation in the susceptibility to avertin, and the narrow margin between the therapeutic and toxic dose. Foremost among the contra indications are conditions lowering liver function. Other contra indications are conditions decreasing kidney function, severe cardiac disease, old age, cachexia, marked shock, and severe acidosis.

GEORGE R. McAVULFF, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Podlaaszy H. B. and Knorr, N.: The Comparative Value of the Serological and Roentgenological [1] Diagnoses of Congenital Syphilis. *Radiology* 1933, XX, 337

Up to recent times the detection of congenital syphilis has depended entirely on examination of the blood except in cases in which it was known that the mother had syphilis or the newborn infant presented definite evidences of the condition. Lately the roentgenological diagnosis of syphilitic involvement of the osseous system has been developed to a high degree of accuracy. The study here with reported was undertaken to compare the relative values of the 2 diagnostic procedures. The methods and results of serological tests and the roentgenological findings as reported by various observers are discussed at length.

In the study on which this report is based, 1,000 mothers and 974 infants were examined serologically. In 30 cases the findings were positive for either the mother or the infant. In 13 both the maternal blood and the cord blood were positive. Seven of the infants in these cases were examined roentgenologically shortly after birth. In 17 cases the serological findings in the maternal blood were positive, but those in the cord blood were negative. Five of the infants in these cases were subjected to roentgenological examination immediately after birth and 4 were examined roentgenologically several months after birth.

In the cases of 6 babies positive indications of osseous syphilis were discovered in the first week of life. The blood of the mothers of these babies was positive. The blood of 1 of the babies was not examined. In the cases of 4 the cord blood was positive and in the case of 1 it was negative. Of 7 cases in which X-ray examination of the baby at birth was negative, the mother and baby were positive in 3 and the mother was positive and the baby was negative in 4. In 6 cases examinations were made at intervals of six, seven, and ten months, and in 3 after one year. Of these 6 the roentgenological findings were positive in 3. Of the latter the serological findings were positive in 2 and the maternal blood was positive but the cord blood was negative in 1. In the 3 cases in which the roentgenological findings were negative the babies' blood was negative while the mothers' blood was positive. In 1 case in which the roentgenological examination after one year was positive for osseous syphilis, the roentgenological examination at birth had been negative and both mother and baby were positive serologically. In other words, there was positive agreement at birth between

the roentgenological findings and the serological findings in 5 cases. The roentgenological findings were positive in 1 case in which the blood was negative, and were negative in 3 cases in which both the baby's blood and the mother's blood were positive. In 7 cases the X-ray findings agreed with the negative cord blood. In 1 case positive findings of osseous syphilis were detected one year after birth when the cord blood was negative the re-check on the baby was negative, and the maternal blood was positive.

In summarizing their article the authors state that in a large percentage of cases in which there are positive serological findings in the infant with or without similar findings in the mother osseous changes are demonstrated on roentgenological examination.

Negative roentgenological findings should not be considered as ruling out the presence of syphilis as they may indicate merely the absence of osseous syphilis at birth. Roentgenological evidence of osseous syphilis may be obtained in the absence of positive serological findings in the baby. Cases of positive maternal blood and negative cord blood demonstrate the importance of re-checking the serological and roentgenological examinations at intervals of from three to six months. Negative serological findings in the cord blood and negative roentgenological findings in the presence of maternal syphilis are not absolute evidences of the absence of syphilis in the newborn.

ADOLPH HARTUNG, M.D.

RADIUM

D'Erudio, A. S.: Radium Therapy of Reticulo-Endotheliomata—Reticulomata—of the Tonsil and Pharynx (La radioterapia nei reticulo-endoteliomi—reticulomi—della tonsilla e del cavo faringeo). *Radiol. med.* 1933, XV, 873

The author briefly describes the histological appearance of malignant reticulo-endotheliomata, tumors characterized by rapid growth and invasion of reticulo-endothelial tissue. He believes they are true tumors, although by some they have been described as simple inflammatory hypertrophies. He reports three cases.

The first case was that of a man forty-nine years of age who had a tumor of the left tonsil with metastases in the lateral cervical glands. On May 11, 1931, irradiation of the left lateral cervical and sub-maxillary regions was begun by means of a gauze apparatus containing four tubes of 10 mgm. of radium element filtered by a mm. of platinum. The distance between the radium and skin was about 3 cm. The irradiation was given for twenty-one days

and produced an intense erythema. On June 28 not a trace of the tumor could be found. In April, 1932 the irradiation was repeated as a prophylactic measure according to the author's custom. A year and a half after the treatment the patient was free from symptoms.

The second case was that of a woman eighty two years of age who had a tumor of the lymphatic plexus of the right half of the pharynx which had invaded the tonsil, the right pillar of the fauces, and the lateral cervical glands on the right side. The initial treatment begun September 9, 1932 was the same as that in the first case but was continued for only seventeen days. The patient is now in excellent health and free from symptoms but will be given a prophylactic treatment.

In the third case there was a tumor in the vault of the pharynx which had formed metastases in the

lateral cervical glands. On March 16, 1932 radium irradiation of the left half of the face and lateral cervical region was begun. The technique of the irradiation was the same as in the first and second cases except that five tubes were used. The tumor decreased in size and the patient requested discharge as he felt well. He was advised to come back for further treatment, but refused to do so. On August 1 he returned with a large recurrent tumor. He was then treated with eight tubes of 10 mgm of radium but signs of intracranial involvement developed and he died at the end of fifteen days.

The author emphasizes the danger of underdosage. Too small doses produce radium resistance which makes treatment more and more difficult. The maximum saturation dosage which does not injure the normal tissues should be employed.

AUDREY GOSS MORGAN M D

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Piociński, K.: Morbus Aperti (Morbis Aperti)
Ginek polski 1932 VI, 661

The author reports a case of morbus aperti in a twenty-six months-old child born in the obstetrical and gynecological department of the hospital at Koenigsbuette. On the basis of the history it was possible to exclude a hereditary taint. Examination of the blood of the parents and of the cerebrospinal fluid of the child was negative for syphilis. The pregnancy had proceeded without psychic disturbances, the child was carried almost to term, and the only complication was an abnormally small quantity of amniotic fluid. During labor danger of asphyxia arose on account of the abnormal structure of the skull.

At birth, the child weighed 2500 gm. Its sagittal suture was short but about 1 cm. wide and terminated posteriorly in a bony defect measuring 2 by 1½ cm. The bony defect terminated in a small fontanel, the size of the ball of an adult's finger. Anteriorly the sagittal suture passed over into a large fontanel which terminated at the root of the nose in a bony defect 2 cm. wide. The skin, which was distinctly tense over the site of the defect, allowed the pulsation to be felt. The root of the nose was situated very deep and appeared to lie still deeper because of the marked bulging of the frontal protuberances bulged greatly. The corneas were somewhat dull and the external angles of the eye lids were considerably sunken. The external auditory meati were situated very low and the auricles stood away from the head. The soft palate was cleft. The child breathed with a snoring noise. The second, third, and fourth fingers of the right hand were grown together and were movable only in the proximal joints. The fifth finger was free, but like the others was movable only in the proximal joint. The thumb of the right hand was in the pollex varus position. There was one common nail to the third and fourth fingers. The left hand showed the same peculiarities except that each finger had a separate nail. The roentgenogram showed not only lack of differentiation of the individual phalanges, but also the bony confluences. The toes of both feet were grown together. The great toes projected and turned inward in the form of a hallux varus. The roentgenogram showed absence of the two first phalanges of both feet.

Another examination made twenty-six months later showed changes affecting chiefly the skull. The fronto-occipital circumference was 47 cm. the mento-occipital circumference, 55.5 cm. the distance of the small fontanel from the root of the nose

15 cm. the fronto-occipital distance 15 cm. the biparietal distance 14.5 cm. the temporal distance, 13 cm. the buccal distance, 12 cm. and the orbital distance, 10 cm. The child was 79.5 cm. long. The large fontanel gaped and was stretched, and the small fontanel was the size of the ball of a little finger. The root of the nose was sunken and the nose had the shape of a parrot's beak. The upper lip was short, and in the lower jaw there were two teeth. Ophthalmological examination showed increased intra-ocular pressure and stalk papillitis in the atrophied region. The roentgenogram disclosed shortening of the dimensions of the base of the skull, widening of the sella turcica, gaping of the large and small fontanels, and very distinct digital impressions. The child showed no psychic disturbances of any kind. It did not speak but cried hoarsely.

The article includes a photograph of the child and roentgenograms of the base of the skull, the left hand, and the left foot. This is the thirty third case of morbus aperti to be reported.

ST. VON SOMMERENSKI (G).

Meleney F. L.: A Differential Diagnosis Between Certain Types of Infectious Gangrene of the Skin; with Particular Reference to Hemolytic Streptococcus Gangrene and Bacterial Synergistic Gangrene. *Surg Gynec & Obs* 1933 LV, 847

The author calls attention to the importance of making a prompt differential diagnosis between the various types of infectious gangrene of the skin because the treatment of the different types varies markedly and early institution of the proper treatment may not only save life but will decrease the disfiguration and deformity.

He divides infectious gangrene of the skin into two types, the acute and the chronic. The acute type may be divided into three subtypes: (1) the familiar gas gangrene, (2) gangrene due to the hemolytic streptococcus, and (3) gangrene due to erysipelas. The differential diagnosis between these types is very important. In the gangrene due to the hemolytic streptococcus and in that due to erysipelas, the author found the hemolytic streptococcus in large numbers, but in the gangrenous erysipelas it was found in the skin at a distance from the lesion. The differential diagnosis was based on the fact that in the second type of gangrene the onset is insidious with mild fever and mild constitutional symptoms, but alarming local symptoms. Extreme redness and swelling are usual. The gangrenous areas appear after from three to five days and are often preceded by large blisters. There is extensive necrosis of the connective tissues, and the inflammatory exudate about the borders of the le-

sions contain few bacteria. The gangrene is not sharply defined, like that of erysipelas which begins with a much more intense onset with a chill and the rapid onset of high fever. The differentiation of these two conditions is of great importance as in the gangrene due to the hemolytic streptococcus prompt multiple incisions are indicated to lessen the tension and provide drainage whereas in that due to erysipelas such radical treatment is not necessary.

Chronic gangrene is of four types. The first type is the postoperative progressive bacterial synergistic gangrene which follows the drainage of infection of the abdomen or chest. A week or two after the operation multiple small foci of infection which the author describes as carbunculoid in appearance, are seen. The course of the condition is slow and there is a gradual destruction of the epidermis and often of all of the layers of the skin. A typical non-hemolytic streptococcus may be isolated. The treatment indicated is radical excision of the entire process.

The second type of chronic gangrene is gangrenous impetigo. This occurs usually in debilitated persons. As a rule the lesions are multiple. They begin as an ordinary impetigo and contain large numbers of staphylococci. Hemolytic streptococci may be secondary invaders. The treatment indicated is careful removal of the scabs and the application of ammoniated mercury ointment.

The third type of chronic gangrene described is the fusospirochetal gangrene. This occurs in wounds contaminated by mouth secretions. In the early stages there is an inflammatory reaction. This is followed by progression not only in the skin, but also in the deeper tissues, possibly extending into the bones and joints. Smears show fusiform bacilli and spirochetes. The treatment usually indicated is intensive arsenical medication, but in late spreading cases in which the lesions are very large, amputation may be necessary.

The fourth type of chronic gangrene is amebic gangrene. This follows drainage of an amebic abscess of the liver and should be recognized at once for that reason. Emetin medication is indicated.

EMORY ANDREWS, M.D.

Nicholson G W: Studies on Tumor Formation
Guy's Hosp Rep., Lond. 1933, lxxviii, 151

This article is a discussion and review of contemporary biological teaching regarding tumor formation as understood by the morbid anatomist. The author concludes his discussion by stating his own view that tumor formation is a reaction to stimulation which is comparable to all reactions of the organism or cell, differing in degree but not in principle. Its visible anomalies or peculiarities of structure are commensurate with, and expressions of those of behavior. It is a reaction, an innate physiological potency or "capacity" of every dividing cell. It represents and is, the innate, physiological function of growth by division.

M. HERBERT BARKER, M.D.

Paulian Stefan Popescu and Marinesco-Slatina
Subungual Glomic Tumor Associated with
Hemihyperthermia. Complete Cure Following
Surgical Ablation (Tumeur glomique sous-
unguiale suivie d'hémihyperthermie et guérison com-
plète après l'ablation chirurgicale) *Ann d'anal*
path 1933 x, 271

The case reported was that of a woman aged thirty two years who had complained for some time of pain increased perspiration, and a sensation of heat in the right arm and the right side of the body and face. On examination a small tumor was found under the nail of the right middle finger and slight pressure on this part produced pain in the regions in which the symptoms were present. Local skin temperatures were found to be from 0.5 to 2 degrees C higher in various parts of the right hand and arm as compared with the left.

The finger nail was removed and the tumor shelled out. The neoplasm was found to be encapsulated and to measure 4 by 6 mm. Section showed it to be composed of blood vessels, endothelial cells, nerve fibers and edematous connective tissue.

The authors cite also the case of a girl thirteen years old which was reported by Barre and was of a very similar nature except that the tumor was under the nail of the left middle finger.

They state that subungual tumors of this type with their attendant phenomena represent a definite clinical entity. They have collected a number of reports on such neoplasms most of them from the French literature. MARSH W. POOLE, M.D.

Woglom W H. Absorption of the Protective
Agent from Rats Resistant to a Transplantable
Sarcoma. *Am J Cancer* 1933 xvi, 873

In animals that have rid themselves of transplantable neoplasms resistance to a second inoculation is often so definite and so striking its resemblance to the immunity produced by most bacterial diseases that a search for an immune body has been industriously pursued ever since spontaneous cure was first observed nearly thirty years ago.

If an antibody of any sort is present in resistant animals its amount must be infinitesimal or its action remarkably weak as it has escaped discovery although sought by many investigators for many years. The feebleness of the immune response is indicated by the fact that regressing tumors can be propagated with a fair degree of success and contain many actively dividing cells.

Although it has been suggested that the spleen of an immune rat contains some principle able to attack the cancer cell directly it is possible also that the agent damages this cell indirectly by acting on the capillaries or the connective tissue at the inoculation site in such a manner as to prevent vascularization of the graft. All of the evidence so far acquired supports the view that in the tissues of a resistant animal there is an inimical substance that acts on the sarcoma cell without an intermediary.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Plucinski, K.: Morbus Aperti (Morbus Aperti)
Glasnik polske 933 1, 66

The author reports a case of morbus aperti in a twenty-six months-old child born in the obstetrical and gynecological department of the hospital at Koenigsbrette. On the basis of the history it was possible to exclude a hereditary taint. Examination of the blood of the parents and of the cerebrospinal fluid of the child was negative for syphilis. The pregnancy had proceeded without psychic disturbances, the child was carried almost to term and the only complication was an abnormally small quantity of amniotic fluid. During labor danger of asphyxia arose on account of the abnormal structure of the skull.

At birth, the child weighed 3500 gm. Its sagittal suture was short, but about 1 cm. wide, and terminated posteriorly in a bony defect measuring 3 by 1 1/2 cm. The bony defect terminated in a small fontanel, the size of the ball of an adult's finger. Anteriorly the sagittal suture passed over into a large fontanel which terminated at the root of the nose in a bony defect 3 cm. wide. The skin which was distinctly tense over the site of the defect, allowed the pulsation to be felt. The root of the nose was situated very deep and appeared to lie still deeper because of the marked bulging of the frontal protuberances bulged greatly. The corneas were somewhat dull and the external angles of the eyelids were considerably sunken. The external auditory meati were situated very low and the auricles stood away from the head. The soft palate was cleft. The child breathed with a snoring noise. The second, third, and fourth fingers of the right hand were grown together and were movable only in the proximal joints. The fifth finger was free but like the others was movable only in the proximal joint. The thumb of the right hand was in the pollex varus position. There was one common nail to the third and fourth fingers. The left hand showed the same peculiarities except that each finger had a separate nail. The roentgenogram showed not only lack of differentiation of the individual phalanges, but also the bony coalescence. The toes of both feet were grown together. The great toes projected and turned inward in the form of a hallux varus. The roentgenogram showed absence of the two first phalanges of both feet.

Another examination made twenty-six months later showed changes affecting chiefly the skull. The fronto-occipital circumference was 47 cm. the mento-occipital circumference, 55.5 cm. the distance of the small fontanel from the root of the nose

35 cm. the fronto-occipital distance, 15 cm. the biparietal distance, 14.5 cm. the temporal distance, 13 cm. the buccal distance 12 cm. and the orbital distance, 10 cm. The child was 79.5 cm. long. The large fontanel gaped and was stretched and the small fontanel was the size of the ball of a little finger. The root of the nose was sunken and the nose had the shape of a parrot's beak. The upper lip was short and in the lower jaw there were two teeth. Ophthalmological examination showed increased intra-ocular pressure and stasis papillaris in the atrophied region. The roentgenogram disclosed shortening of the dimensions of the base of the skull, widening of the sella turcica, gaping of the large and small fontanel, and very distinct digital impressions. The child showed no psychic disturbances of any kind. It did not speak, but cried hoarsely.

The article includes a photograph of the child and roentgenograms of the base of the skull, the left hand, and the left foot. This is the thirty third case of morbus aperti to be reported.

ST. VON SORDEANSEKI (G).

Maloney F. L.: A Differential Diagnosis Between Certain Types of Infectious Gangrene of the Skin; with Particular Reference to Hemolytic Streptococcus Gangrene and Bacterial Erysipelas Gangrene. *Surg. Gynec. & Obs.* 1933, Vol. 547

The author calls attention to the importance of making a prompt differential diagnosis between the various types of infectious gangrene of the skin because the treatment of the different types varies markedly and early institution of the proper treatment may not only save life but will decrease the disfiguration and deformity.

He divides infectious gangrene of the skin into two types, the acute and the chronic. The acute type may be divided into three subtypes: (1) the familiar gas gangrene, (2) gangrene due to the hemolytic streptococcus, and (3) gangrene due to erysipelas. The differential diagnosis between these types is very important. In the gangrene due to the hemolytic streptococcus and in that due to erysipelas the author found the hemolytic streptococcus in large numbers, but in the gangrenous erysipelas it was found in the skin at a distance from the lesion. The differential diagnosis was based on the fact that in the second type of gangrene the onset is insidious with mild fever and mild constitutional symptoms, but alarming local symptoms. Extreme redness and swelling are usual. The gangrenous areas appear after from three to five days and are often preceded by large blisters. There is extensive necrosis of the connective tissues, and the inflammatory exudate about the borders of the le-

prognosis depends upon the blood platelet count. When this is raised there is a tendency toward thrombosis. When it is lowered, hemorrhages are liable to occur.

6 *Diabetes* Except in severe septic conditions, which neutralize the effect of ordinary doses of insulin, and in cases with a high degree of arterial degeneration, diabetic patients can be brought all most to the level of normal surgical risks.

7 *Jaundice and hepatic insufficiencies* The danger of hemorrhage in patients suffering from jaundice is universally recognized. It is best combated by the intravenous administration of calcium chloride.

8 *Renal insufficiencies* Very little can be done to reduce the operative risk in gross kidney disease. Chronic parenchymatous nephritis is an exceedingly grave risk. When the blood urea is 0.3 per cent or less, the patient is a good risk when it is 0.5 per cent, he is a poor risk, and when it is above 0.6 per cent, postoperative uræmia may be expected.

9 *Endocrine derangements* Patients with endocrine derangements are subnormal surgical risks.

In conclusion the author states that in the cases of temperamental toxic, and obese patients and those with gross derangements of metabolism great care is necessary when operation is to be performed.

J. THORNTON WITHERSPOON, M.D.

DUCTLESS GLANDS

Cushing, H.: *Dyspituitarism; Twenty Years Later with Special Consideration of the Pituitary Adenomata* Arch. Int. Med., 1933 li 487.

Cushing discusses pituitary adenomata to call attention to these processes as secretory stills which, in spite of their pathological structure, are probably elaborating an excess of the normal hormone.

The normal adenohypophysis (anterior lobe of the pituitary gland) as distinguished from the neurohypophysis contains only three cellular elements. These represent a single or chief element in two stages of activity. The chief element the primary mother cell, possesses a finely granular non-staining (chromophobe) cytoplasm which, in the process of ripening acquires coarse secretory granules of two distinguishable types known as "acidophilic and basophilic." The ripened cells show an individually characteristic paranuclear Golgi apparatus which is predetermined by the morphology of the Golgi body in the mother cell.

From the clinicopathological standpoint it is significant that there are three cell types and that only three types of pituitary adenomata are recognized. One of the latter is composed of chromophobe elements apparently identical with the non-secreting mother cells. Another shows an abundance of acidophilic elements and causes the clinical manifestations of overgrowth. The third is purely basophilic in composition and produces effects sug-

gesting an excess of the gonad stimulating principle. Accordingly there are neither cell types nor corresponding adenoma formations which represent more than three possible hormones and the purely chromophobe adenomata do not show any secretory hormone.

The chromophobe adenomata produce a slow compression of the active secretory elements of the pituitary gland with symptomatic consequences which are purely hypopituitary. While they are found most commonly in adults, they occasionally occur in children. In the young their dual inhibitory effect on growth-promoting and sex maturing elements is more evident.

The author reports a case of dual hypopituitarism. The patient was a pituitary dwarf with a combined intrasellar cranio-pharyngioma and a chromophobe adenoma. She was operated on twice for neighborhood symptoms and was under observation for a period of eight years. Intramuscular injections of a growth extract relieved the symptoms, but caused no acceleration of growth.

Also reported are the cases of two young normally adolescent boys who had a very rapid increase in stature. While it is not easy to determine just where overgrowth of this kind ceases to be merely excessive and becomes pathological, such overgrowth is suggestive of an excess of the growth hormone.

The acidophilic adenomata are associated with pathological overgrowth represented by gigantism and acromegaly. This fact has led to the theory that the growth hormone is a product of these cells and this theory has been confirmed by the demonstration of absence of acidophilic elements in the pituitary glands of hereditarily dwarfed mice. The dystrophic changes in the reproductive apparatus which so often accompany clinical gigantism and acromegaly may be explained by the compression effect of a growing adenoma upon the remaining normal elements in the gland.

As an example of this complication the author reports the case of a woman who had postpartum amenorrhea continued lactation fugitive acromegaly enlargement of the sella with neighborhood symptoms demanding operation, a chromophobe adenoma, subsequent pressure symptoms benefited by irradiation, and ultimate symptomatic involvement of the hypothalamus from intracranial expansion of the tumor with resulting hypothalamic (autonomic) fits.

Special attention was paid to certain features of this case. The acromegalic symptoms were fugitive and the adenoma while acidophilic in type, was composed chiefly of large undifferentiated chromophobe elements. The author suggests that it may have been an adenoma arising from the pregnancy cells which may be chromophobe elements arrested in the process of ripening into acidophiles. The cells of the tumor may have secreted a lactogenic hormone. The constantly subnormal blood pressure may be ascribed to pres-

sure obliteration of the neurohypophysis, and the amenorrhea may have been due to the compression effect on the cells (whatever they may be) elaborating the luteinizing principle. The skin was pale moist and without striae and the adiposity was generally distributed over the body.

The basophilic adenomata are associated not infrequently with a well recognized polyglandular disorder which like acromegaly varies considerably from case to case. Suggestive clinical examples are found in the literature dealing primarily with osteomalacia, hypertension, diabetic obesity and dermatological conditions.

The author reports the case of a woman who at the age of nineteen years, developed amenorrhea, plethoric adiposity, purple striae atrophicae, and hypertension and throughout the remaining thirteen years of her life suffered from multiple fractures, glycosuria, and hypertension. Autopsy in this case disclosed a basophilic adenoma, hypertrophy of the adrenal cortex, and extreme atherosclerosis.

The basophilic activation of the neurohypophysis with the neurotropic effect of abdominal adiposity, hypertension, cholesterolemia and atherosclerosis is discussed in detail.

In discussing the secondary endocrine effects the author states that in pituitary basophilism the thyroid appears to be surprisingly inactive, the parathyroids appear to be hyperactive, osteomalacia is a striking feature, and very little thymic tissue is found. As no demonstrable change has been observed in the islet tissue of the pancreas, the glycosuria is ascribed to activation of the neurohypophysis by the cells of the pars intermedia. Marked hypertrophy of the adrenal cortex occurs with characteristic hypertension, hypertrochosis, and deviation of the secondary sex qualities such as the masculinization of women. The gonadal changes are difficult to appraise.

J. EDWIN KIRKPATRICK, M.D.

Ménière: The Parathyroid Glands and the Various Parathyroid Syndromes (Les parathyroïdes et les divers syndromes parathyroïdiens) *J de méd de Bordeaux* 933 CX, 71

The author first reviews in detail the anatomy, embryology, physiology and pathology of the parathyroid glands.

The signs of acute parathyroid insufficiency are those of neuromuscular hyperexcitability. The responses to the galvanic current vary with the degree of the deficiency. The symptoms of parathyroid gland deficiency have been produced in animals by the administration of guanidine. Koch found methyl guanidine in the urine of parathyroidectomized dogs. By some, the parathyroid glands are believed to have a regulatory action on the detoxifying function of the liver.

Chronic parathyroid insufficiency is present in infantile tetany, the tetany occurring during pregnancy, lactation and menstruation, gastro-intestinal tetany and the tetany associated with fever.

Under the term "dysparathyroid syndromes" are included varicose, gastric and duodenal ulcers. The syndrome of hyperactivity of the parathyroid glands is observed in von Recklinghausen's disease of the bones, Paget's disease of the bones, osteomalacia and arthritis deformans. The possibility of involvement of the parathyroid glands in certain types of epilepsy, myasthenias, and Parkinson's disease is discussed briefly.

The therapy of parathyroid insufficiency includes the administration of calcium, ergosterol, and parathyroid gland extract, grafting of the fresh gland, and irradiation with ultraviolet light. Calcium and parathyroid gland extract have produced favorable results in the treatment of varicose and chronic peptic ulcers. Surgical removal of the parathyroid glands is indicated in von Recklinghausen's disease of the bones and scleroderma.

The different techniques of surgical approach to the parathyroid glands are described. The glands are found by following the inferior thyroid artery to its termination. When they cannot be isolated, Leriche advises tying the inferior thyroid artery $\frac{1}{2}$ cm. below its bifurcation. The ischemia thereby produced gives a result similar to that of ablation of the gland. Surgical treatment directed toward the parathyroid glands have given very favorable results in arthritis deformans but not in Paget's disease of the bones.

FRANÇOIS JIMEN DE PRUNZ, M.D.

EXPERIMENTAL SURGERY

McDowall, R. J. S.: Experimental Shock. *Brit M J* 933 4, 690.

The author defines shock as a state which results from a fall of arterial blood pressure which, if severe, may lead to death from oxygen want. It may result from (1) cardiac failure, (2) loss of blood, (3) undue opening up of the blood vessels which are normally closed, or (4) a reduction of the peripheral resistance to the flow of blood from the arterial system. It may be also chemical or nervous.

The chemical variety is typified by histamine shock which occurs following considerable destruction of tissue and has a delayed onset. Histamine acts by dilating the capillaries, thus producing an insufficiency of blood, the animal, as it were, bleeding into its own capillaries. The capillaries become more permeable and the blood becomes more concentrated. The shock is increased by cold and by anesthesia induced with ether or chloroform. In clinical cases it develops after burns and other conditions causing extensive tissue destruction. The author attributes its aggravation by cold to exhaustion of the suprarenal glands. Because of this action of cold, it is necessary to keep shocked patients warm. Anesthetics act by dilating and increasing the permeability of the vessels and paralyzing the normal mechanism of compensation. Therefore if shocked patients must have an anesthetic, nitrous oxide gas or a local anesthetic should be given.

The nervous varieties of shock may result from physical damage to the vasomotor center or its efferent paths from afferent impulses leading to carbon dioxide loss (acapnia) or from inhibition of the center. Damage to efferent paths may be due to injury to the spinal cord, fat embolism in the medulla or high spinal anesthesia. Concussion of the vasomotor center itself also produces shock. Acapnic shock results from loss of carbon dioxide which throws the vasomotor center out of action. Hence, overbreathing should be avoided and every effort made to reduce sensory stimulation during operation. Herein lies the value of morphine. Depressor shock often results from a trivial injury. In this condition the vasomotor system is evidently in

hibited by afferent impulses such as mechanical stimuli. Depressor shock can be produced in an animal with the chest open and under artificial respiration. Both acapnic and depressor shock can be prevented by deep anesthesia. Hence many patients with primary shock are benefited by anesthesia as has long been known by surgeons.

The author believes that the whole clinical subject of shock needs to be re-investigated, and that the determination of the best method of dealing with histamin is one of the most important problems of modern surgery. He urges a better differential diagnosis of the types of shock which necessitates a more thorough and painstaking study of the patient himself.

CLARENCE C. RAED, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

SURGERY OF THE HEAD AND NECK

Head

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International Abstract of Surgery

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one illustration to show this type of closure, and Veau states that he writes this chapter with timidity because he has not had sufficient experience to state with authority the value of the method he proposes.

The final chapters deal with speech and include studies by Borel on the physiology of speech in patients with cleft palate and on the training of speech after operation.

Dorrance (18) states that it has been generally accepted that in most cases of cleft palate the palate is short. Cleft velum alone and cleft palate which extends as far forward as the anterior palatine foramen are usually shorter than lip-jaw-palate splits.

In a study of the speech mechanism in 2 cases in which the nose and septum had been lost, a sphincteric closure of the nasopharynx was observed. Further anatomical studies showed that the superior constrictor of the pharynx was inserted into the velum and interlaced from side to side so that on contraction there was a definite sphincteric closure between the nasal and the oral pharynx.

Dorrance is convinced that the tensor palati muscle is shorter in persons with cleft palate than in normal individuals. The independent pull exerted on each side by the shortened muscle drags each half of the cleft velum forward and outward causing the tips of the cleft uvula to point toward the median line.

Division of the hamular process will release the tension produced by the tensor palati muscle and thus permit mesial displacement of the palatine insertion of the superior constrictor muscle of the pharynx. The function of the tensor palati muscle will be altered from that of a tensor to that of an elevator and the tensor palati rendered an assistant to the levator palati muscle.

For clefts of the velum Dorrance usually performs the 2 stage "push-back operation."

The "push-back operation" is used also in cases with congenital shortening of the palate, cleft velum and cleft palate extending as far forward as the anterior palatine foramen. In these cases the operation ends with complete restoration of the palate. It is applicable likewise in cases of complete cleft palate in which the velum is short and the von Langenbeck operation cannot insure success.

In dealing with cases of lip-jaw palate splits, in which the soft tissue is of adequate length, a modified von Langenbeck operation is performed.

In Dorrance's opinion the age of choice for operation is between the second and fifth years, preferably after the fourth year.

Dorrance's book, "The Operative Story of Cleft Palate,"¹ is a complete recording of the procedures used for closing cleft palates from the first operations down to and including Dorrance's own observations and work. There are a great many illustrations of instruments and operative procedures, and over 4,000 citations to the literature are included. The author's "push-back" operation is described in detail. The great number and the complex nature of the methods of closure which have been worked out make a review of the book of little value but before any procedure is labeled "new" the originator should consult this book for he will almost assuredly find at least his idea already in print.

Browne (13) states that the mechanism which closes the nasopharynx is the same as that which closes so many other passages in the body—the device of a complete muscular ring or sphincter.

The posterior half of the sphincter is made up of the superior constrictor and the palatopharyngeus which, by simultaneous contraction, produce a shelf on the posterior wall of the pharynx known as "Parsavant's ridge."

The anterior sling consists of the 2 levatores and the 2 tenaces of the palate.

The aim of the operation for cleft palate obviously becomes the construction of a contractile ring similar in structure to the normal ring and capable of closing the nasopharyngeal passage.

The sacrifice by the Brophy operation of the germs of the permanent teeth by the leaving of septic wires among them for long periods is too high a price to pay for easier joining of the palate.

The production of a simple stiff partition between the nose and the mouth which means success in dealing with the hard palate means failure in dealing with the soft palate.

If the mucoperiosteum is boldly detached from the alveolar ridge along its outer border so that it is simply left attached by its anterior and posterior ends, it can be pulled inward to any extent needed by the width of the cleft and still left in contact with the underlying bone.

The solution of the dilemma of the disposal of the posterior palatine artery appears to be the deliberate arrangement of an adventitious circulation to replace the natural circulation by cutting the artery at a preliminary operation.

The operation for closure of the soft palate is essentially one of muscle transplantation and requires wide denudation of the bordering mucosa so that wide areas of submucous tissue can be approximated.

The rigid bony framework of the pharynx is of normal size but the muscles available are short and atrophic. The freeing of the levator palati is easy enough, but the turn of the tendon of the tensor palati round the hamular process fixes it firmly to the boundaries of the nasopharynx and changes its direction so that it pulls directly outward against the line of junction. It is fortunate that the hamular process can be very easily snapped off at its base without interfering with the synovial sheath of the pulley and thereby displaced inward and upward to a position which will not interfere with the joining of the 2 tensors. In this new position it must finally become fixed by the healing processes so as to afford once more a fulcrum to the tendon that curls round it.

As a preliminary to the joining of the cleft it is necessary to re-arrange the blood supply by cutting the posterior palatine artery and to remove the tonsils.

In every case without exception the hard as well as the soft palate should be completely mobilized.

Proper mobilization is proved when the sides of the cleft tend to fall together and can be pushed into contact with the very slightest pressure.

The only danger to fear after the operation described is sepsis of the corroding type which will break down any wound in which it occurs.

Mitchell and MacKenzie (47) after a long period of dissatisfaction with the single stage von Langenbeck operation, have found a routine 2-stage delayed flap operation of advantage. The first stage includes the elevation of flaps through lateral incisions and their detachment from the posterior surface of the bony palate. In the next stage the flaps are re-elevated and freshened in the midline and the closure is then completed.

Gehing (24) reported 30 cases operated upon by the von Langenbeck procedure. In 14 healing was satisfactory, in 14 it occurred with defects and in 2, the result was a failure. Speech was normal in 3 cases.

Monnier (48) operated in general according to the procedure of von Langenbeck with certain modifications. He divides his 150 cases into 4 groups. Of those of Group 1, cases of partial cleft, correct healing resulted in 86.5 per cent and good speech in 70 per cent. Of those of Group 2, cases of subtotal cleft, correct healing was obtained in 72.3 per cent and good understandable speech in 63 per cent. Of those of Group 3, cases of one-sided cleft the operation was followed by correct healing in 39 per cent and by good speech in 58 per cent. Of those of Group 4, cases of double-sided cleft, a defect requiring secondary closure persisted in all. The defects were mainly on the

front part of the hard palate. Good speech was obtained in 42 per cent of the cases of Group 4. Monnier endeavors to build functioning lips, produce correct lip curves, reconstruct the soft and hard palate without a defect, and fashion a long movable soft palate. He has obtained better results in lip correction since he has sutured the mucous membrane, muscle and skin individually.

Liebermann (38) suggests a procedure in which a flap with its raw surface toward the nasal cavity is raised on one side and a flap on the other side is raised with its raw surface toward the oral cavity. These flaps are laid upon each other, raw surface to raw surface, and a double row of stitches is carefully introduced. This appears similar to the Lane operation.

For the after-care in cases of cleft palate, Grammelsdorf (26) recommends vioform or iodoform packs in the lateral incisions and protection of the suture line with lead, silver or celluloid plates. Of further importance is a specialized massage of the soft palate which is deficient in movement, and at the same time speech training.

Kutlowaki (37) has completely recorded the preoperative and postoperative care in cases of cleft lip and palate which is followed on the service of John Staige Davis.

Pagnamenta (52) reports over 150 cases in which the von Langenbeck operation for cleft palate was done. He confirms the contention of Ernst that the background is too wide a mesopharynx or too short a soft palate. In the cases reported speech was quite understandable although very nasal. Pagnamenta believes that the age at which the operation is performed is unimportant as far as the results are concerned. As a fistula in the lateral incision resulted in only one of the cases reported he does not advocate the use of the Monnier band. Healing was best in patients under two years of age. In the cases of complete double clefts, which constituted 16 per cent of the total number, healing over occurred without a defect. An overstretched soft palate and poor condition of the teeth have an unfavorable influence on speech.

Operation performed early—toward the close of the second year—has a better prognosis as regards plastic reconstruction even if its mortality is higher than that of operation performed later. In its cases of serious clefts the attainment of a completely normal condition by means of surgery alone cannot be expected. The help of the dentist and speech teacher is necessary in addition.

Logan (39) gives an excellent summary of cleft palate operations and cites instances in which upper jaw deformity occurred (1) without any

operation on the palate, (2) following simple closure without bone wiring, and (3) following direct bone wiring. However he remains convinced that the principle of the direct application of force through the medium of silver wires and lead plates high on the buccal side is an appropriate treatment for the very wide clefts with marked deviation of the nose and its septum from the median line of the face. He states that as far as he knows no one has ever investigated and presented evidence as to the location of the germs of the permanent teeth at the age at which operation must be done for the bone correction. On the basis of an original investigation he shows the exact position of the deciduous teeth in relation to the germs of the permanent teeth between birth and six months. Special attention is called to the fact that all developing permanent teeth that are to replace deciduous teeth are located at this age to the lingual side, with the exception of the bicuspid germs, which are to the occlusal side of the erupting deciduous first and second molars. Of special interest is the finding that the permanent laterals and bicuspid teeth have not yet started to calcify in spite of the fact that they erupt previous to the permanent cuspid, the crown of which is far advanced in its calcification.

Logan believes that operation should not be undertaken before the age of two months, and should be done preferably between the ages of two and four months.

Logan's operation is described in minute detail with photomicrographs of jaws showing the positions of tooth buds and wires. Silver wires are passed above the deciduous tooth buds without damaging the permanent buds which are lingual or occlusal. On the sound side they are introduced in front of the cuspid eminence and in front of the zygomatic process and brought across and out on the cleft side in front of the zygomatic process. They are fixed over lead plates and anchored with a "uranoplastic button." A second posterior wire is carried clear around the alveolus and twisted together in front. By this direct force the alveoli in front are brought into contact. The remaining cleft is closed by a modified Lane flap turned over from the sound side to engage under a flap from the cleft side.

The soft palate is closed a year later but the technique of the closure is not described.

From a study of specimens of the jaws of 35 subjects ranging in age from birth to fifteen years, Logan and Kronfeld (40) have drawn conclusions regarding the time of calcification of teeth which vary from those on which the standard accepted tables are based. They have summarized their

findings in relation to cleft-palate surgery. A careful study of the work should be of great benefit to all engaged in this field of surgery.

"At the time when wiring through the upper jaw is preferably performed (between the second and fourth months) the tooth germs are lying in the jaw in such a crowded position that passing wires between them, as originally suggested by the advocates of the direct application of force is now known to be impossible. It is possible to pass wires or other suture material through the maxilla above certain germs, at a point medial from the cuspid eminence and distal from the deciduous and permanent central incisor germs, or immediately above the deciduous lateral incisor. A second point of entry is located in the field between the cuspid eminence and the zygomatic process above the first deciduous molar germ. If the points of entry for the wires are high enough and at the exact landmarks specified, the only possibility of injury to the germs is that which confronts the operator when sufficient care has not been exercised in the location of the very definite anatomic landmark described.

"Attention of all members of the profession who perform surgical operations for closure of complete congenital clefts or those clefts which extend to the maxillary ridge is invited to the necessity of obviating the making of incisions through the attached overlying soft tissues on the lingual aspect of the maxillary ridge for any considerable distance from the border of the cleft on either the long or short fragment for the purpose of elevating the periosteum for coaptation in the median line. Nor should such incisions be made for the purpose of everting or transferring of this tissue toward the center of an open cleft until the patient is at least one year of age, for the germ of the permanent lateral incisor is encased in the fibrous tissue of the maxillary ridge during this period. Furthermore, the germ of the permanent central incisor is not yet within the bone of the ridge in the first six months."

HARELIP

In "Traitement du Bec-de-Lièvre Unilatéral," Plesner (55) has recorded the teachings of his master Venu. He believes that the essential anatomical parts are always present in a cleft lip, and that repairs of cleft lip which are not absolutely normal are due to failure of the surgeon to recognize and carry out a correct operative plan. With regard to reconstruction of the nose, he is not sure that perfection will ever be obtained.

Plesner discusses the methods of other surgeons in the correction of harelip and reviews the

history of the Mirault procedure and its variations. As Mirault's description of his original operation is not clear, much liberty has been taken in its interpretation and the operation has often been said to consist in taking a flap from the lateral side and swinging it to the medial side of the cleft. Plessier states that in Mirault's first method a flap was taken from the midline and crossed over to the outside (Monod and Vaumerts, 1908). This is said to have had an unfavorable influence on the surgery of harelip for almost a century. Its poor results are shown by illustrations.

Mirault's second method in which an incision was made straight down the lip, is said to be much better. Veau has developed a technique which differs from it only slightly. The lateral column of the philtrum and the cupid's bow are said to be constructed by this procedure.

The importance of recognizing the basic anatomy and carrying out the correction accordingly is emphasized. Any operation that takes a flap (from one side or the other) is said to sacrifice form. "Thus the first objective which is necessary when one undertakes the treatment of a harelip is to make incisions on the skin surface which give a vertical suture line." An operation with a flap from the outside which was described by Veau in 1915, but abandoned by him later, presumably in favor of the present plan, is shown by a diagram.

The technique of the operation for partial cleft is quite well illustrated and described. The floor of the nose is not opened, and no undermining is done in the buccal fornices.

The illustration of the condition before operation shows the nostril on the cleft side only very slightly widened and the diagram of the lip after the closure shows the same width. Whether the widening is supposed to be corrected and the ala lifted to its correct level is not clear, as there are no photographs of patients to show the repair of partial clefts.

In the last half of the book Plessier discusses the nose. In the second paragraph he says "The imperfections due to a deformity of the nose are less objectionable than those due to a poor operation on the cleft lip."

The normal contour of the nose is well described, but Plessier states that a perfect nose is never obtained. He describes the methods of other surgeons and gives a rough classification of the deformities that persist after operation. The chapter on anatomy, which is excellent, deals more with deformity than with normal anatomy.

The operation is described in detail and is shown by illustrations.

Eight complete clefts with good operative results are illustrated. Some of the faults occurring with any operative plan may be found. In most of the cases the nose is not good, and in some of them the deflection of the columella has not been corrected. The lip and cupid's bow appear perfect in some of the cases, and the floor of the nose, although not clearly shown in all, seems adequate.

Plessier is enthusiastic regarding the procedures described and states that he will be curious to know after a few years whether American surgeons still employ the technique they use today.

Kiskadden and Tholen (36) have successfully used the Roe, Thompson, and Mirault operations, but recently have performed the Mirault operation as modified by Blair and regard it as the most satisfactory. The latter includes a satisfactory plan for making the nostrils symmetrical and forming a floor for the vestibule. There can be no question that closing the lip on a zig zag line prevents retraction. Moreover, the unpleasant notching of the vermillion border is entirely avoided by the use of a flap as outlined by Blair. It has not appeared necessary to close the skin muscle, and mucous membrane in 3 layers. However, 1 or 2 catgut sutures to approximate the muscle will prevent the slight hollowing found in many lip scars due to muscle retraction or poor apposition of the cut fibers.

Double cleft lip presents many very difficult problems which must be solved if a satisfactory end result is to be obtained. The usual plan consists in incorporating the skin of the prolabium within the lip and, at a later date, tubing it to form and lengthen the columella.

Occasionally the septum in its growth will utilize the prolabial skin and form a columella automatically. However this is not the rule. Under no circumstances should the premaxilla be removed.

Formerly Kiskadden and Tholen used wires rather extensively in both single and double cleft lips when the separation of the palate seemed excessive. At the present time wire is usually found to be sufficient, and in early cases with but moderate separation, reliance is placed on the closure of the lip to mould the arch in position.

In secondary corrections one may find that in cases operated upon late the upper lip is left long and the vermillion border is quite hidden by its retraction. In such cases the Gillies cupid's bow operation is used. This procedure consists in outlining upon the upper lip the exact shape and position desired for the new vermillion border, sacrificing the skin between this new line and the old irregular line and then undermining the

mucous membrane and resuturing it to the new border.

An upper lip which is tight and very short, may be lengthened and broadened by inserting a pedicle from the lower lip. The pedicle is formed by the excision of a central whole-thickness or V-shaped wedge.

Many patients operated upon late present a retracted upper lip which renders the profile extremely ugly. They are described as somewhat dish-faced, with a protruding chin, a redundant lower lip, and a retracted upper lip and nose.

The procedure advocated by Blair—advancing the cheeks and lip on the face by wide lateral incisions in the upper alveolar sulcus—has given excellent results. Kischadden and Tholen use it routinely in all cases in which the lip in profile is recessive, and have found that almost without exception it has resulted in marked improvement of the profile. Invariably the columella is deeply attached and retracted at its insertion in the lip and must be freed from the septum and re-inserted as high as possible.

In cases presenting a bony defect or deficient arch, the lip and base of the nose may be brought forward by cartilage implants or permanent prosthetic appliances attached to the teeth.

Blair (2) states that one of the worst nasal deformities, but perhaps the deformity least mentioned is that associated with cleft lips and palates. In the article cited he repeats his description of the nasal deformity which was published elsewhere.

In the original operation there should be sufficient mobilization of the soft parts to permit fixation of the tissues with a correct level of the ala and the formation of an adequate floor of the nostril. When this has been accomplished there will almost necessarily be correction of the deviation of the whole nose and columella.

If there has been no early correction of a harelip or if the correction has not restored good nasal contour the deformity will increase and become more solidly fixed with the growth of the face. The deformity is perhaps worst when there has been an early forceful closure with wiring of the spread maxillae. Surgical correction necessitates an extensive procedure with complete freeing and rotating of the nostrils into position. If the teeth are not sufficient in number or properly placed to maintain a normal profile of the soft parts, a dental prosthesis may be necessary.

For double harelip Horsley (19) has used a modification of the Rose operation and the operations devised by Blair and Federspiel with very satisfactory results. He emphasizes the im-

portance of mobilizing the surrounding tissues of the lip and the alae thoroughly keeping close to the maxillary bone. The mucous membrane bordering the adjacent sides of the lip clefts and the premaxillary process is removed, according to the type of operation. The first step in suturing consists in reconstructing the floor of each nostril by interrupted sutures of No. 000 plain catgut. The vermillion border is constructed by suturing the mucous membrane of the lateral flaps together beneath the premaxillary process.

When the lip deformity is associated with a protruding premaxillary process, a submucous, oblique incision, or a V resection of the lower border of the nasal septum must be performed first to permit retraction of the premaxilla. The apparently shortened columella will lengthen with subsequent development. Care must be exercised to avoid removing a large section from the nasal septum and replacing the premaxillary process too far posteriorly. Otherwise the tip of the nose will be drawn in and the premaxilla rotated until the incisor teeth erupt backward into the mouth. Under no conditions should the premaxillary process be removed. Transfixing wires or sutures should not be used in the premaxilla and lateral alveolar process as they will greatly interfere with subsequent development of bone and teeth and often will produce an over-correction.

Horsley has performed 1-6 consecutive operations—84 for harelip and 92 for cleft palate—without a death or serious complication.

Lyerly (42) states that in the repair of a harelip it is most important, for a pleasing result to correct the nasal deformity. The best time for operation on a harelip is during the first few days or weeks after birth.

In the infant, the protruding premaxillary process can frequently be pushed back by thumb pressure and the molding of the repaired lip may be depended on to bring it still further back to its natural position. If the process is displaced extremely forward or the septum and processes have become ossified as in older children, a submucous section or resection of the vomer and nasal septum just back of the premaxillary process will be necessary. This will allow the premaxillary process to be brought back to the proper alignment. The edges of the alveolar margin should be freshened and fixed in position until union occurs. Occasionally the repaired lip will hold the premaxillary process in the proper position, but it is usually better to fix this process to the lateral processes by silver wires. In older children fixation may be obtained by wiring the teeth of the median processes to those of the lateral processes.

To mobilize the soft tissues in reconstruction of the lip and reshaping of the nose, it is necessary to resect the attachment of the ala of the nose and adjacent part of the lip from the superior maxillæ to a wide extent. The premaxillary process should never be removed but should be used to form part of the lip. The skin portion of this process should be trimmed to a quadrilateral or wedge shaped structure. The flaps of mucous membrane from the lateral processes should then be adjusted to each other in a smooth outline to form the lip border beneath the premaxillary process. In this plan there is no forcing of skin from the lateral part below the median process which may make the lip too long. In order to keep the skin sutures free from tension the muscle and mucous membrane should be sutured under the lip in separate layers. In the formation of the nostrils care should be taken to see that they are of normal and equal size on the two sides.

Veau and Plessner (68) describe the technique they are now using for double harelip, not as final but because others have seen the work and have reported it.

The face in bilateral cleft lip is operated on in a stage of evolution and little faults that are apparent immediately after operation may become worse as time goes on. Therefore, methods and results should not be reported too early.

In the closure of a single cleft lip and palate two fundamental procedures have been developed (1) an operation for the lip the technique of which is the same in both single and double cleft lips and (2) an operation for the nose which is the procedure of most importance in the closure of a double cleft.

In the first step a flap is turned from the septum and the side of the premaxilla and the anterior two-thirds of the maxillary side of the palate is raised completely as a flap with a prolongation going clear forward around the end of the maxilla. Then by completely everting the septal flap and the small flap from the anterior end of the maxilla and suturing them together the floor of the nose is constructed and lined. The posterior palate flap is swung over and anchored with one suture to the everted septal flap.

Next the same side of the lip is closed by a method which includes complete freeing of the alar border and a straight-line closure down the lip. The vermilion border from the prolabium is preserved and used for lining of the lip and a small part in the center is preserved for permanent repair. (Apparently some of the vermilion of the lip is sacrificed.) The lip is firmly anchored to the premaxilla by a wire which engages the muscle,

transfixes the premaxilla and is fastened over a gauze pad on the opposite side.

After this one sided operation the premaxilla is, of course drawn far over to the closed side. From three to four months later the opposite side is closed. This is done in the same way but a little difficulty is experienced because of scarring and some change in the incision of the prolabium. Again, however a small part of the prolabium vermilion is preserved as permanent.

In partial clefts or clefts with a small bridge of tissue across them, the repair is easier because there is apparently more material and the deformity is less. The bridges of tissue are opened and the repair is done as described for complete clefts.

After the closure of both sides the upper lip is well protruded because the premaxilla is clear out in front of the maxilla.

Gillies and Kilner (25) believe that the original deformities of the nose and lip are often so complex that it is unreasonable to expect any one primary operation undertaken at a very early age to accomplish more than an aseptical closure with simple adjustment. This produces a sound basis for future work of a more cosmetic nature.

The most common contour deformity seen in cases of harelip and cleft palate operated upon late is produced by flatness of the lip and depression of the nose. The flatness of the lip is most marked when the premaxilla is removed.

The nasal deformity is said to be dependent on the following factors (1) backward displacement of the maxillæ resulting from the scar tissue pull which follows successful closure of the palatal cleft (2) definite underdevelopment of the normal amount of bone in the parts of the maxillæ which border on the pyriform opening (3) backward pressure of a tight lip and (4) definite failure in the forward growth of the nasal septum. As a natural corollary to the backward displacement of the maxillæ the upper teeth come to lie well inside the teeth of the lower jaw mastication being thereby rendered inefficient and the lower lip ultra prominent.

The operative procedure that will be found most widely applicable to this type of lip and nose has been called the 'buccal inlay'. It consists of the introduction of a Thiersch graft on a mould designed to free the lip and nose from the underlying retroposed maxillæ. Freeing and loosening of the lip in this way allows the wearing of an upper denture sufficiently prominent to produce a normal contour and carrying well in advance of the natural position, artificial teeth which articulate normally with the lower teeth.

The results of this simple procedure are said to be remarkable. The whole character of the face is improved and final successful operations on the lip and nose become possible and are more easily accomplished.

One of the most common cosmetic faults is found in cases of double harelip, for the so-called prolabium is often placed so far down the lip that the lobule of the nose is dragged down with it.

The mucous membrane of the premaxilla having failed to unite with that of the advancing lateral processes, forms a pseudovermillion border for the prolabium which has tempted many a surgeon to utilize it in the construction of the new lip margin to the permanent detriment of the patient.

The variability in the size of the prolabium appears to lend weight to the opinion that there is in all cases of cleft lip and palate a varying degree of non-development of tissue rather than merely a non-union of normally developed parts. From the point of view of plastic surgery of the lip, it is imperative in all cases of down-drawn nose tip to take the prolabial skin out of the lip and suture it sufficiently high on the free border of the septum to allow the tip of the nose to come forward and upward into normal position.

A very pleasing "non-surgical" type of lip may be obtained by performing what Gillies and Kilner have called the "cupid's bow" operation. In principle this consists in discarding the existing skin-vermillion junction altogether and making a new curved lip border at a higher level. The result is an attractive short lip with full mucous membrane and at least a suggestion of a cupid's bow.

In a few cases there has been so much surgical and developmental loss of tissue that nothing short of the grafting of a whole-thickness flap from the lower lip (Abbe's operation) is likely to result in any striking improvement.

Millen (50) has described the developmental anatomy of the orbicularis oris and has shown his findings with photomicrographs. The surgical importance of the muscle is also dwelled on, and a good understanding of the muscle may be obtained from his paper.

NOSE

Blair and Brown (5) have presented a very complete account of their corrections of nasal deformities. The general plan of caring for patients with such deformities and detailed legends for 64 illustrations are given. Included among the operations were total and partial nose reconstructions—the formation of a nose from the fore-

head in a case of congenital absence of the entire nose—operation for ocular hypertelorism (this is probably the first time surgical correction of this deformity has been reported)—operation for bifid nose, operation for advancement of the nose, lip, and face—the care of fractures with old displacements and external scarring—cartilage transplantation for depressed bridges—the removal of parafinomata and repair of the repair of radiation burns and reconstruction of the columella.

In a shorter article Blair (2) describes and shows by illustrations harelip deformities, saddle nose hump nose, partial losses and reconstruction, total reconstruction, and deformities resulting from fractures.

A close study of wax or plaster casts and preliminary preparation of patterns for transplants are probably necessary steps if the best results are to be obtained.

For the transplant for depressed bridges, autogenous fresh cartilage is used exclusively because it is thought to be the safest material.

In reducing the size of a hump nose, chisels and biting forceps are used in preference to rasps, and narrowing the nose is frequently found necessary.

Incisions are placed just within the nostrils and parallel with the free border. If the whole dorsum is to be raised, incisions in both nostrils are connected across the tip of the columella.

For restoring losses of any size, pedicle flaps from the forehead are used almost exclusively. The forehead tissue and skin is so superior to any other available that it is used regardless of the added facial scar. The pedicles are returned to accurate position and the defect is covered with a thick split graft. Such a graft gives ultimately as good a surface as a full-thickness graft. The details of repair are illustrated.

In total reconstruction of the nose practically all calculations are made by measurements of patterns from built-up plaster casts.

The plan of repair consists always, if possible, in using a delayed flap taken from the forehead and lining the nose by turning in delayed flaps from the surrounding skin. Flaps from the neck, chest, and arm are employed only if necessary.

It is possible that most of the apparently unexplained marked nasal deformities are the result of untreated fractures sustained early in childhood. If not corrected such deformities frequently become worse with marked distortion of the septum and deviation of the nasal bones.

Lora (41) characterizes rhinoplasty as millimetric surgery requiring an exceedingly precise and delicate technique, and above all, a correct appraisal of the deformity.

When the malformations are multiple, correction of each one of them is indispensable for a perfect final result.

Seven cases are shown in illustrations, 2 of hump nose, 2 of saddle nose in which autogenous costal cartilage was used, 1 of large nose, 1 of prominent tip, 1 of deviated nose, and 1 of combined deformity. The preparation, anesthesia, and technique of the procedures are well described. Lonsa concludes that careless treatment of the periosteum and perichondrium is the cause of intense reactions which jeopardize the final aesthetic result.

Straatsma (62, 63, 65) believes that, for successful reparative work on the nose, certain standard procedures must be followed. He states that small saddle noses can be corrected by shifting the tissues present, while for larger defects costal cartilage transplants are necessary. Foreign bodies, especially paraffin, are to be condemned.

It is almost impossible to repair losses of the skin or soft tissues by undermining and stretching.

For tip losses the tube-pedicle graft has proved most satisfactory. For complete loss of the nose the method of Blair—the use of a forehead flap—is best.

For the repair of a luteic nose in which there has been a wide loss of the lining a tubed flap from the arm supplies both the lining and the covering.

Straatsma uses the dermal graft in the repair of small saddle defects of the nose. This graft is de-epithelialized derma and is prepared by shaving off and discarding the top layers of the skin. The basal layers are used as a subcutaneous graft. This type of graft was first introduced by von Eitner and was called to Straatsma's attention at the clinic of Blair.

Mallinck (43) reports 2 cases of his correction of limited depressions of the nose and shows the procedure by diagrams. His method consists in the endonasal transposition of the lateral cartilages together with the subcutaneous tissue and their implantation into the dorsal depression.

Free cartilaginous grafts are unnecessary and the frequently deformed lateral cartilages are corrected.

Mootnick (49) states that autoplasmic costal cartilage is the best material from the standpoint of ultimate healing and organization.

The perichondrium must be left always on one side of the rib. Curling of the cartilage toward the perichondrium is due mainly to faulty technique.

In the use of a bone implant it is absolutely necessary to include the periosteum. When infection occurs a bone implant will surely be expelled whereas cartilage or ivory still may remain

in situ if the proper postoperative treatment is given.

The use of paraffin did not prove successful and has now been abandoned. Gold and celluloid have been employed successfully by some surgeons, though they act as distinct foreign body irritants. Walrus tusk and vegetable ivory and other imitations of ivory are not tolerated by the body tissues, and should not be used.

Next to cartilage, ivory obtained from elephant's tusk is most suitable. Mootnick describes the operation and the handling of the ivory, and includes in his article the photographs of 4 patients for whom ivory was used. He does not state how long the transplants have been in place.

Israel (32) classifies and shows by illustration 6 types of external deformity. As a transplant for the correction of a depressed bridge rib cartilage has given him the best results.

The intranasal approach, or incision, should be selected because it avoids the formation of an unsightly scar.

Eitner (27) finds the correction for minor form changes of the tip of the nose very difficult. For cases of projecting nose tip he recommends raising of the nasal bridge and septum and the insertion of ivory.

Halla (27) reports success from Hollander's method of injecting fat for the correction of saddle nose. Either animal or vegetable fat can be used. The fat changes to soap, and the tissue becomes inflamed. The fat is absorbed, but the autoplasmic effect is not disturbed. Fat injection is not to be confused with the injection of paraffin.

Forero (22) illustrates his methods of correcting deflected, depressed and humped nasal bridges, deflection of the lower end of the septal cartilage and separated saddle cartilages.

Wodak (59) lists 8 errors in the form of the tip of the nose and gives his method of correction, which includes the use of ivory transplants.

In a review of Sanvenero-Rosselli's *Plastic Surgery of the Nose* (58) Tanturi states that the book is based on the author's personal experience, and that the results of the operations are well shown by photographs.

Clery (16) has given an interesting history of the development of rhinoplastic surgery.

EYE

Blair (3) gives illustrations of 17 cases of various lesions or methods of repair of defects of the lids. Full thickness grafts for lids are preferably taken from behind the ear rather than from an upper lid. The technique of grafting ectropion of both lids at one time and the com-

blation of a "stent" graft for a lower lid with a wider application of the graft down over the cheek are shown. For certain cases of paralysis of the face with sagging of the lid live autogenous fascial strips are recommended. Photographs of 2 patients for whom such strips were used are shown. Fracture of the orbital border may result in depression of the entire bony floor with consequent diplopia. This should be corrected early not only on account of the external appearance, but also because of the associated disturbance of ocular function. Blair's method of elevating the bone from within the antrum is described, and roentgenograms of a patient showing the displaced bone and its elevation and fixation by an iodiform pack in the antrum are presented.

Blair, Brown, and Hamm (6) state that corrective surgery about the inner canthus is more complex than corrective surgery in any other part of the ocular appendages. If the inner canthus is greatly displaced its correct replacement may be extremely difficult. Trauma accounts for most of the displacements, but there is nearly always a deformity of this region in persons with congenital deformity or absence of the nose. Poorly executed plastic operations, paraffin injections, and neoplasms account for loss of tissue in many cases. Descriptions or diagrams of operations are shown.

Blair, Brown, and Hamm (7) have described with diagrams of the operation and photographs of the patients the procedures they use for the correction of ptosis and epicanthus. For ptosis, a live autogenous strip of fascia lata is employed in the form of a loop which is anchored above to the frontalis muscle and below to the edge of the tarsal plate. In epicanthus, which is due to a congenital or acquired vertical shortness of the soft tissues, a plica is formed that gives an apparent horizontal redundancy. In the correction flaps are fashioned from this apparent redundancy. It will then be found that there is never a real excess of tissue and that in some of the cases of acquired deformity the addition of more skin in the form of a graft may be necessary.

In another article (11) Blair, Brown, and Hamm show by illustrations and report their treatment of 2 lesions not included in the articles cited above (6-7). Hemangiomas of the face involving the eyelids are thought to be best controlled by the implantation of gold radon seeds. Seeds of small content have been implanted directly in the lid without known damage to the eye. Because of the possible rapid destruction of tissue by these growths, very early treatment is recommended. The correction of ocular hypertelorism or better the operative attempt to make

the excessive distance between the eyes less noticeable is briefly described and the photograph of a patient subjected to such an operation is shown.

Kilner (35) reports 9 cases of ocular lesions with photographic records. The operations included the reconstruction of a contracted socket with Thiersch grafts to permit the insertion of an artificial eye of normal size, the use of Thiersch grafts for the correction of ectropions due to lupus, burns, congenital deficiency of the palpebral skin, and loss of bony support due to extensive infra-orbital necrosis and the correction of marked depression of the orbit with diplopia by means of fat transplants and elevation of the lids by the excision of skin within the hairline. Six other cases are cited. Kilner states that the Blaskovic technique of shortening the levator is used for ptosis and the procedure described by Blair, the use of slings of autogenous live fascial strips, is employed for facial paralysis.

Spaeth (61) states that the most difficult part of plastic surgery is the careful planning necessary for success.

Living tissue grafts as well as formalized cartilage are considered. Although Spaeth has repeatedly obtained good results from homografts of cartilage he has never had any success with homografts of skin. Epithelium must not be grafted upon the bulbar conjunctiva as the natural desquamations which form may cause a chronic mechanical conjunctivitis. Naturally this does not apply if the eye is lost as an organ of vision.

In the correction of an ectropion the scar is resected, the lid margins are sutured together and the graft is laid in one piece over the defects. The intermarginal adhesions are left in position for from three months to a year while massage is applied to the reconstructed lids to prevent further cicatricial contraction. The correction of an ectropion of one lid alone is best carried out by the Gillies inlay method.

Drooping of the outer canthal angle is easily corrected by a small finger like flap. In the slightest degrees of drooping Spaeth's modification of the classical Fuchs tarsorrhaphy gives good results. In epicanthus, 2 flaps are outlined from the outer surface of the epicanthal fold. One flap is then placed in the lower lid and the other in the upper lid, as is done most successfully by Blair.

Eyebrows may be replaced by a pedicled flap or a free skin graft from the opposite eyebrow, a pedicled flap over the hair line, or best of all, a graft from the scalp. Eyelashes may be replaced by free skin grafts from the lower edge of the eyebrow.

Buried white silk sutures have been repeatedly used for the correction of ptosis, for lagophthalmos and for old facial paralysis with obliquity of the palpebral fissure.

Marquez (45) reports a case of blepharoplasty and presents a photograph of the final result. The original lesion is not shown but is described as being a carcinoma, the size of a hazelnut, situated on the outer half of the lower lid.

Following complete excision a flap taken from the rest of the lid and a part of the cheek over the zygoma was switched across the defect.

Marquez says that he reports this case only to raise publicly the question of priority of this variety of blepharoplasty. It is certain to him and others that the operation was first described by Diego de Argumosa in 1833 rather than by Dieffenbach in 1835.

LIPS

Martin (46) describes a method of constructing an entire new lower lip and chin, a modification of an operation first described by Bernard in 1853. It is not justified in the presence of large multiple or bilateral metastases. No extensive neck dissections can be carried out during the procedure.

A full thickness block of lip is excised, the incision being kept at least 1 cm. clear of involvement on each side. Incisions are then made back along the lower border of the mandible and through the mucosa in the buccal fornix, and the lateral flaps reflected from the bone. To allow the flaps to be shifted toward the midline triangles are excised from above and lateral to the angle of the mouth on both sides. The mucosa of the flaps is saved to be turned out to form a part of the new vermillion border. Closure is made under the mandible by drawing the flaps toward the midline throughout the new buccal fornix up the midline and up on both sides above the angles of the mouth.

In complete resection of the lip repair is made by turning down 2 Estlander flaps and uniting them in the midline. As this causes the mouth to become quite narrow a later plastic operation must be done to widen it.

In Perpina's (54) method total excision of the lip and most of the chin is done and the mucosa then undermined and drawn together in midline. The remaining skin of the chin is undermined and pulled up and triangles are removed from each side. The new skin border is sutured to the mucosa and the triangular skin excisions are closed.

For the correction of large defects of the lower lip Parin (53) turns a skin flap from the chin in

ward to form the inner side of the lower lip. A skin flap from the abdomen first implanted on forearm, is carried up and attached to cover the defect and also the newly made chin defect.

Hutton (30) reports a case of complete upper lip reconstruction with the use of a scalp flap and Thiersch grafts with mucous membrane for lining. Originally lining had been attempted with non hair bearing skin brought up on a flap from the chest, but this was not successful.

For lip and face reconstructions in women scalp flaps are not utilizable. Blair Brown, and Hamm (9) illustrate the use of a single pedicled—non tubed—forehead flap in the case of a patient whose lip was removed because of an old de generating λ ray keratosis.

Blair, Brown, and Hamm (10) show their method of switching vermillion bordered lip flaps from the upper to the lower lip and of totally reconstructing the lower lip in the case of a man by the use of a double pedicled scalp flap.

FACIAL PARALYSIS

In discussing the operative treatment of facial palsy, Ballance and Ducl (1) state that the functional result of direct nerve suture or anastomosis is never perfect.

First, a radical mastoid operation is done. Then, with extreme care the outer wall of the aqueduct is removed up to the region of the geniculate ganglion. The fibrous sheath is opened. The nerve is not transplanted outside the canal. The damaged ends are cut away and the gap is filled with a graft taken from the external respiratory nerve of Bell. Any nerve, sensor or motor may be used so long as it is of suitable size. It is seldom that the gap is more than 5 mm. long. Gold leaf or platinum foil is placed over the graft and a flap of temporal muscle is brought down to fill the mastoid cavity.

With regard to the choice of the time to operate Ballance and Ducl state that no delay is justifiable. In all early cases of mastoid involvement in inflammatory or caused by direct injury operation should be done immediately the sooner it is done the easier it will be the less the damage to the nerve and the better the condition of the muscles. Suppuration is not an indication for postponement of the operation on the nerve.

Protocols of experiments are given with comments and the findings of final examinations clinical and physiological. The result obtained in a case of facial paralysis in an eight months-old baby is shown by a photograph. No mention is made of mechanical support of the face in cases of division of the peribulbar branches of the nerve.

in which intratemporal anastomosis would not be of advantage.

The practical outcome of the work of Ballance and Ducl (19) so far as it is of interest to otologists, is the fact that the experiments led them to deprecate anastomosis of the facial nerve with one of the adjacent nerves in the neck for the restoration of lost facial function and to advise, in place of this method, the employment of an autoplasmic graft to bridge the gap from the proximal to the distal segment caused by injury or disease.

Twelve patients and the results of operation in the cases of 4 of them are shown by photographs. In many instances it is too early to predict how complete the recovery will be. The cases are recorded to show the variety and extent of injury. The final outcome will be reported later.

The area of destruction of the nerve varied in length from 15 to 40 mm.

It seems certain that even most careful observation of the face by the anesthetist during the operation for sudden spasm of the muscles as an indication of injury of the nerve is unreliable. Trauma severe enough to cause facial palsy may be inflicted without any observed spasm, and while spasm may be informative at times when it is seen positively lack of such observation is not an accurate means of knowing whether when, or how extensive an injury to the facial nerve may have occurred.

These experiences point conclusively also to the advisability of uncovering the nerve at once whenever facial palsy immediately follows an operation on the mastoid, in order to determine the extent of the damage. The rewards of such action are manifest. Compression or slight injuries may then be remedied by decompression with assurance that complete or nearly complete recovery will be obtained in many cases, whereas long delay will often result most unsatisfactorily.

In addition to such an occasional case, there will be many cases in which prompt inspection will disclose the fact that the accident has destroyed or damaged a longer segment of nerve. Immediate operation will permit decompression of the nerve above or below the point of injury in time to avert the dire consequences of prolonged inflammatory compression. A suitable graft may be introduced to replace the damaged segment at once. As there can be only slight atrophy of the muscles from non-use, a quick and more perfect recovery is assured.

Ballance and Ducl definitely demonstrated in their animal experiments, that any autoplasmic nerve graft, either motor or sensory and with the direction of the proximal and distal ends either

maintained or reversed will successfully bridge the gap and restore the function of a divided facial nerve.

Whereas the external respiratory nerve of Bell was originally advocated as the source of the graft, Ducl lists several reasons why an intercostal nerve is the more practical.

Delay in operating may make all the difference between success and failure.

Operating in a suppurating field demands great subsequent care to prevent necrosis of the graft until it is protected by healthy granulations.

Simple and exact rules for the care and dressing of the area are given.

Sheehan (59) reports the correction of a case of unilateral facial paralysis. First, fascial slings were put in to correct the distortion about the mouth mechanically. Then, the muscles about the orbit were re-animated by switching flaps of the temporal muscle into the orbicularis and a third flap of the temporal into the frontalis, together with a flap from the opposite active frontalis. In the third stage the inequality due to atrophy was corrected by the insertion of dermoepidermic (dermal) grafts to raise the general skin level. Finally several minor post-operative adjustments were made.

MISCELLANEOUS

Sheehan (60) describes the successful treatment of a keloid on the back of a negro's neck. The area was excised and a tube of radium emanations was placed in the wound for from two to three hours before the wound was closed.

In a general discussion of full-thickness grafts, Padgett (51) reports their use for contractures about the neck, portwine stains of the cheeks, rhinophyma, and the replacement of eyebrows.

Havens (28) suggests placing 2 grafts under pedicled grafts, with one raw surface out to line the flap itself and one down on the base so that it may be well along toward healing when the flap is used.

In a report of the care of burns and the repair of their defects Blair Brown, and Hamm (8) illustrate the complete restoration of the contour of the neck and lower part of the face by the use of full-thickness grafts.

Blair (4) summarizes briefly the general principles in 9 types of surface repair.

Iglauer (31) gives the details of the use of "negocoll" and "hominit" in plastic surgery.

Straatsma (62) reports with illustrations a case of deformity of the jaw in which contour was corrected with a dermal graft a case in which a rib-cartilage transplant was used to build out a

chin, and a case in which a deficiency of the lower lip was corrected with a pedicled graft from the neck.

Rush and Rush (57) describe their method of making plaster casts for study in reparative surgery.

Straith (66) emphasizes the psychological aspects of plastic surgery and presents photographs of patients with deformity of the nose, chin, eye sockets, ears, and face.

Maliniak (44) summarizes his ideas of the indications for the surgical restoration of the aged face. The general principles of surgical correction of the aged face and neck include the removal of the redundant skin after its wide undermining through a periauricular incision which is easy to conceal. The atonic muscles are raised by subcutaneous loops of fascia or chromic catgut. The redundant skin of the eyelids is removed by means of incisions placed in the natural fold of the upper eyelid and under the ciliary border of the lower eyelid.

Dartigues (17) deals at some length with the present status of plastic and æsthetic surgery and concludes that it is necessary for this type of work to arrive at an absolute equality with other branches of medicine and surgery.

Clauze (15) defends the position of æsthetic surgery mainly by photographs of patients before and after operation for hump nose, depressed nasal bridge, redundant skin of the lids and face, ptosis of the breasts, and ptosis of the abdominal wall.

Fruehwald's (23) book illustrates his methods in cosmetic surgery of the nose and ear and in the removal of wrinkles and folds from the face. No before and after photographs are shown because in Fruehwald's opinion, such photographs are of no particular value to the reader.

Eckstein (20) demonstrates good results from the use of hard paraffin and claims that this method proved trustworthy in 1,000 cases. Hospitalization is not necessary, and there is very little discomfort. The dangers of using soft paraffin are cited.

Kazanjan (34) has given a concise outline of his work on prosthesis of the mouth and jaws. The descriptions and illustrations make this a valuable reference paper. In the same article Rowe and Young discuss amputated and cleft palate prosthesis.

Kazanjan (33) reports, with photographs of the patients, 5 cases in which a double resection of the mandible was done. The results are excellent in all, but 1 of the patients is still under treatment.

On the study models the location of the operation was determined as about the mandibular first molar region.

In addition to the preliminary work with models specific mandibular teeth are removed at least a month before the operation. If this step is left until a later date, the healing process will undoubtedly be considerably delayed. The next step is the construction of splints.

An incision about 1 in. long was made along the lower borders of the mandible. The bone was exposed and separated from its periosteum on the buccal as well as the lingual side. The operative exposure was extended to the buccal cavity and sectioning of the bone was done with a Gigli saw. In order to have good control of the direction of the saw, a curved serrated hæmostat bent approximately to the contour of the mandible was clamped to the bone and the Gigli saw was introduced distally to the clamp. As one line was cut, the clamp was shifted forward according to the measurements and the sectioning repeated.

As soon as the sectioning had been completed the hooked wire of the splint was introduced and the parts were fastened together. In addition intermaxillary elastics were applied to the maxillary and mandibular splints. Wire suturing at the lower border of the mandible was discarded as it seemed unnecessary and undoubtedly caused irritation.

During the healing of the bone it was necessary from time to time to make adjustments of the splint in order to improve the occlusion of the teeth.

One of the arguments advanced against this type of operation is that sound teeth are sacrificed. This of course, is apparent. However the majority of the patients have previously lost some molars. Another argument presented against the operation is that the exposure of the oral cavity invites infection. Judging from the cases operated on and from clinical observations in cases of compound fracture this possibility need not be considered a contra indication.

Operations about the jaws, mouth, and face may frequently be carried out under anesthesia produced by blocking the second and third divisions of the fifth nerve deep in at their exits from the cranial cavity. For some procedures this anesthesia may be the one of choice, and a wide range of usefulness is summarized by Brown (12).

The technique of the injection is not difficult, but the injection of novocain is not comparable to the injection of alcohol for neuralgia.

The lower border of the zygoma is determined first and then the site of the condyle is ascertained

by having the patient open or protrude the lower jaw. The condyle is nearly always felt definitely as it slides forward on the articular tubercle (eminence). The point of insertion of the needle is from 2 to 2.5 cm. in front of the tragus just below the lower border of the zygoma. From here it passes between the coronoid process and the condyle of the lower jaw (sigmoid fossa) and just anterior to the articular tubercle.

On its course inward to the pterygoid plate the needle passes through the parotid gland and the masseter temporal and external pterygoid muscles. It may encounter also the transverse facial, internal maxillary middle meningeal, and masseteric arteries.

After gently striking the pterygoid plate the point of the needle is carried up by short withdrawals and re-insertions, to the undersurface of the great wing of the sphenoid, which is about at a right angle to the pterygoid plate. From this stage of the procedure the undersurface of the greater wing is equally important as a landmark as the pterygoid plate itself.

To inject the third division of the nerve the needle is carried backward by short withdrawals and re-insertions against the pterygoid plate and being held up against the sphenoid wing. When the posterior border of the plate is reached, the needle slips off and the patient usually experiences momentary severe pain. At this point the fluid is injected.

To inject the second division of the nerve the needle is carried forward and the fluid is deposited in the sphenomaxillary fossa.

Pain and discomfort following the injection are rare. Patients have complained very little, and the average discomfort is less than that following the average peripheral injection. Stiffness of the jaws might be expected, especially if much hemorrhage occurred along the tract, but we do not believe that persistent stiffness has occurred in this series. One patient submitted to the injection willingly 4 times another 3 times and 2 patients twice each.

Among the conditions and operations for which this type of anesthesia may be used are carcinoma of the antrum, carcinoma of the face, carcinoma of the lip including cases in which switching of vermillion-bordered lip flaps is done, carcinoma of the buccal mucosa, block glandular dissections, tumors of the upper and lower jaws, open reductions and simple reductions with inter dental wiring of fractures of the upper and lower jaws, bone grafting for non-union of fracture of the jaw, double osteotomy for deformity of the lower jaw, drainage and osteotomies for osteo-

myelitis of the jaws, radical resection for ankylosis of the jaw, osteotomies and plastic operations on the face for the secondary repair of extensive face injury, extractions of teeth (impacted and infected), exploration for a broken hypodermic needle, secondary repair in cases of carcinoma of the lip, harelip, the removal of a bullet from the antrum and parotid tumor.

In 22 cases tracheotomy was probably avoided by the use of this anesthesia.

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ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Cohen, I.: Osteomyelitis of the Skull. *Ann. Surg.* 1933 xcvii, 733

The symptoms of osteomyelitis of the skull are largely those of its complications. In the primary cases the condition is associated with malaise, local pain, and fever. In the secondary cases the onset is often overshadowed by the picture of the nasal sinus involvement. When the sinus involvement is cared for and there are no other complications, high fever is not the rule even when the extension of the osteomyelitis is relatively widespread. The abscess of the scalp marking the site of an extension makes its appearance insidiously. It lacks heat and may not be particularly tender. Prior to its appearance the patient often complains of generalized headache. As extensions of the disease take place without general manifestations and without subjective symptoms, they must be watched for constantly. This applies also to intracranial complications. For a time head ache and lassitude may be the only signs of a brain abscess.

The usual roentgen picture is that of a "moth-eaten" bone. Areas of rarefaction may be separated by several centimeters of normal appearing bone.

In the absence of brain complications, the course of the disease is long drawn out.

SAMUEL KARR, M.D.

EYE

Verhoeff, F. H., and King, M. J.: Leptotrichosis Conjunctivae (Parinaud's Conjunctivitis): Artificial Cultivation of the Leptotrichs in Three of Four Cases. *Arch. Ophth.*, 1933 lx, 701

The authors define Parinaud's conjunctivitis as a clinical and histological entity due to infection of the conjunctiva with a leptotrich and associated with inflammatory enlargement of the pre-auricular gland.

In three of four recent cases they succeeded in obtaining the infecting organism in pure culture on artificial media. In each of these cases the clinical and histological features were typical and the organisms were demonstrated in the tissues by special staining methods. For the first growths, special media and conditions of partial oxygen tension were required, but when once obtained the organisms grew fairly well on ordinary media.

In rabbits and guinea pigs, inoculations of the organisms into the conjunctiva produced lesions clinically and histologically similar to those of the

disease in human beings, but the lesions quickly disappeared and were not associated with enlargement of the regional lymph glands. The one at tempt made to recover the organisms from an experimental lesion was successful.

LESLIE L. MCCOY, M.D.

Lacarrère, J. L.: Our Technique of Operating on Cataract by "Electrodiaphanik" (*Nuestra técnica operatoria de la catarata por electrodiaphanik*). *Arch. Fac. de med. de Zaragoza*, 1932 4, 535.

Following a review of various techniques for the removal of the crystalline lens with pincers, needles, or hooks, the author describes a new method which is carried out by means of electricity and is called electrodiaphanik. This method is defined as an electropenetration and separation of the lens. An electrical bismory is used with the ordinary diathermy apparatus. The advantages of the procedure are that penetration of the lens can be secured without pressure and with resulting strong adherence, and there is little or no injury to the surrounding parts. The high-frequency apparatus allows the operator to know the exact intensity of the current used at the moment the circuit is closed. The intensity of the current must be sufficient to cause immediate adherence of the cataract otherwise the operation is difficult and hazardous. The optimum current is maintained by a control which can be set at the point necessary to produce immediate coagulation. This point has been determined by experiments on animals. The technique and apparatus are described in detail and shown by illustrations.

A. E. TART, M.D.

King, E. F.: A Series of Thirty-One Cases of Retinal Detachment Treated by Diathermy. *Brit. J. Ophth.*, 1933, xvii, 167

The Gonin operation for retinal detachment was first performed at Moorfields Eye Hospital in 1919. An analysis of the results by Shapland showed that 27.5 per cent of the first 300 cases were cured (full field and no detachment) at the time the patient left the hospital. However in a few of these cases a recurrence developed later the incidence of cure being therefore somewhat reduced. Because of the difficulty and necessity of exact localization in the Gonin type of procedure, the drastic nature of the operation, and the possibility of complications, the Gustaf operation of multiple trephinations with chemical cauterizations was introduced. Of the first 30 cases treated by the Gustaf operation, a cure was obtained in 45 per cent. In the next 42 cases

the incidence of favorable results was only 23.8 per cent. Technical difficulties in the placing of the trephine openings make it doubtful whether the Gust operation will ever become popular.

The use of diathermy in the treatment of retinal detachment has been advocated chiefly by Weve and Larsson. Weve attempts to seal the hole under ophthalmoscopic control with the diathermy needle and a unipolar diathermy current of from 40 to 50 ma. In the series of cases reported by King the method of Larsson was used exclusively. In the attempt made to produce a diffuse choroiditis without active interference within the vitreous this is analogous to the Gust operation except that the agent used is diathermy instead of caustic potash. After the usual pre-operative preparation and dissection of the conjunctival flap over the previously localized tear the active electrode (a platinum wire 1.5 in. long with a 0.66-mm. ball at the end) is placed over the area to be treated and the current turned on for five seconds. The indifferent electrode is bandaged to the arm or leg. The strength of current used is that sufficient to give a reading of from 0.75 to 1 ampere when the active and indifferent electrodes are held together. These applications are repeated over the area of dry sclera to be treated with an area of about 1.5 mm. between them.

Of the 31 cases treated at Moorfields by this method, 18 (58.06 per cent) were cured. No selection was made. The figures are comparable to those of Larsson, who obtained a cure in 50 per cent of unselected cases.

In the author's opinion the easier technique and favorable results of the operation described seem to render it preferable to the Ganin and Gust methods. As in the other types of operations the absence of a retinal tear and long duration of the detachment render the prognosis less favorable.

WILLIAM A. MANN JR. M.D.

MOUTH

Veau, V. and Plessier, P.: Treatment of Double Harelip. *Traitement du bec-de-lièvre bilatéral total*. *J. de chir.*, 1932, 21, 321.

The face in bilateral cleft lip is operated on in a stage of evolution and little faults that are apparent immediately after operation may become worse as time goes on. Therefore methods and results should not be reported too early. The technique described by the authors in this article is not reported as final, but is presented now after six years, because others have seen the work and have described it.

In the closure of a single cleft lip and palate two fundamental procedures have been developed (1) an operation for the lip, which is the same for both single and double cleft lips, and (2) an operation for the nose, which is the procedure of most importance in the closure of a double cleft.

In the first step a flap is turned from the septum and the side of the premaxilla and the anterior

two-thirds of the maxillary side of the palate is raised completely as a flap with a prolongation going clear around the end of the maxilla. Then, by completely everting the septal flap and the small flap from the anterior end of the maxilla and suturing them together the floor of the nose is constructed and lined. The posterior palate flap is swung over and anchored with one suture to the everted septal flap.

Next, the same side of the lip is closed by a method which includes complete freeing of the alar border and a straight line closure down the lip. The vermilion from the probulum is preserved and used for lining of the lip and a small part in the center is retained for permanent repair. The lip is firmly anchored to the premaxilla by a wire which engages the muscle, transfixes the premaxilla, and is fastened over a gauze pad on the opposite side.

After this one-sided operation the premaxilla is of course, drawn far over to the closed side. From three to four months later the opposite side is closed. This is done in the same way but a little difficulty is experienced because of scarring and some change in the incision of the probulum. Again, however a small part of the probulum vermilion is preserved as permanent.

In partial clefts or clefts with a small bridge of tissue across them the repair is easier because there is apparently more material and the deformity is less. The bridges of tissue are opened and the repair is done as described for the complete clefts.

After the closure of both sides the upper lip is well protruded because the premaxilla is clear out in front of the maxilla. JAMES BARRETT BROWN M.D.

Arnett, J. H., and Ennis, L. M.: Dental Infection and Systemic Disease. A Review of the Literature and a Study of 833 College Students, Including Complete Dental Roentgen Ray Examination. *Am. J. M. Sc.*, 1933, clxxxv, 777.

A review of the literature on the relation of dental infection to systemic disease is followed by a report of complete and careful clinical and roentgen-ray examinations of the teeth of a typical group of college students.

Dental caries was found in 83 per cent of the students, with an average of three and two-tenths carious teeth per person. These figures do not include teeth which had been restored with fillings. More than one-third of the cavities were disclosed by roentgen-ray examination after they had been overlooked at previous clinical examination.

Periapical granuloma was found in 19.8 per cent of the students and in 0.8 per cent of all teeth examined. In the demonstration of this condition also roentgen ray examination was more efficient than clinical examination. Rheumatism chorea or heart trouble was present in 2.9 per cent of the students with granuloma and in 3 per cent of those without granuloma. Students without granuloma were as frequently underweight as those with granuloma. Albuminuria was more common in the

cases of those with granuloma. Electrocardiographs of 160 women showed a normal tracing more frequently in cases in which granuloma was present than in cases in which dental infection was absent.

In conclusion the authors call attention to the fact that these studies were made on youthful persons, and that many of the diseases attributed to dental infection are found most often in persons past thirty five years of age in whom dental infection may have been present over a longer period. The investigation shows the value of complete roentgen ray examinations and the prevalence of dental caries among the youth of America.

CHARLES W. FREEMAN D.D.S.

NECK

Harrington, C. R., Gardiner Hill, H., and Dunhill, T. P.: Discussion on the Use of Iodine Compounds in the Treatment of Thyroid Disease. *Proc Roy Soc Med Lond* 1933, xxvi, 870

HARRINGTON stated that the widely divergent views on the use of iodine in disorders of the thyroid warrant a consideration of the factors responsible for the development of this form of treatment. He cited the administration of burnt sponge, the later use of iodine as advised by Colndet, and the method of iodine therapy advocated by Plummer which is generally accepted.

GARDINER HILL, in discussing the clinical aspects of the administration of iodine in thyroid disease, stated that no improvement was noted in hypothyroid states. Iodine appears to have little or no therapeutic effect on the nodular gland, but nearly all authorities agree that in regions where goiter is endemic iodine prophylaxis is invaluable. The majority of physicians agree that iodine produces striking immediate improvement in Graves' disease.

As a rule marked subjective and objective improvement is noted during the first fortnight after the institution of the treatment. The gland hardens, its vascularity is considerably diminished, and histological sections at this stage show a return of colloid in the vesicles. This reaction should be taken advantage of in the preparation of the patient for operation. Cases of nodular goiter treated with iodine apparently run a less toxic course than those not so treated. After thyroidectomy any thyroid tissue remaining tends to hypertrophy so that periodical doses of X ray irradiation give more satisfactory results.

DUNHILL stated that iodine has a definite value in the treatment of thyroid disease, but the amount given should be less in cases of nodular goiter than in cases of primarily toxic goiter. He believes that the iodine required depends upon the amount and condition of the functioning thyroid epithelium.

M. HERBERT BARKER, M.D.

Maxwell J., and Hogg, J. C.: The Incidence of Laryngeal Cancer. *Lancet* 1933 ccciv 1064.

The author presents statistics from the Registrar General's annual report regarding cancer of the larynx, tongue, and oesophagus during a twenty year period. The incidence of cancer of the oesophagus has shown no change in relation to cancer in general, and the incidence of cancer of the tongue has decreased. On the other hand, the incidence of cancer of the larynx has increased from 1.59 to 2.93 per cent. It is therefore possible that the incidence of cancer of the lower part of the respiratory tract has also increased, particularly if the inhalation of irritants is a factor in the origin of malignancy in the respiratory system. The statistics show no gross variation in the yearly incidence.

E. S. PLATT M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Valdoni P: The Use of Low Pressure and the Inhalation of Carbon Dioxide in Indirect Hemostasis in Craniocerebral Surgery (L'impiego dell'ipossione e delle inalazioni di anidride carbonica nell'emostasi indiretta in chirurgia cranio-cerebrale) *Clin. chir.*, 1933 ix, 373

Valdoni studied experimentally the effect of the inhalation of air under low atmospheric pressure and of carbon dioxide on the venous and arterial pressure and hemorrhage during craniocerebral operations. He reports two clinical cases which confirmed his experimental observations. He observed that the inhalation of air under such conditions causes a decrease in the negative intrapleural pressure and a lowering of the arterial and venous pressures. The decrease in the venous pressure is a direct result of the lowering of the intrapleural tension since the low intrapleural pressure leads to a decrease in the pressure in the large venous trunks of the neck and in the adjoining veins, particularly the cerebral veins. In this way venous hemorrhage during craniocerebral operation is reduced.

In a case in which a cranial operation was performed with the patient breathing rarefied air the venous hemorrhage was diminished, but the method was disadvantageous as the respirations were slow deep and labored and the arterial pressure was reduced.

The inhalation of carbon dioxide caused a lowering of the intrapleural pressure which was less marked than that produced by rarefied air. The venous pressure was reduced, but the arterial pressure was practically unchanged. The respiration was deeper and somewhat more rapid.

When carbon dioxide was administered during the excision of a temporal lobe tumor there was a reduction of the venous hemorrhage without an appreciable increase in the arterial pressure and without respiratory difficulty.

PETER A. ROSE, M.D.

Frazier C. H. and Alpers, B. J. Meningeal Fibroblastomata of the Cerebrum. A Clinicopathological Analysis of Seventy Five Cases. *Arch. Neurol. & Psychiat.* 1933 xxix, 935

Of the seventy five cases of meningeal fibroblastomata reviewed by the authors, the tumor was located in the frontal area of the brain in twenty two, in the precentral area in eighteen, and in the parietal area in eighteen.

Such tumors of the frontal region are apt to reach a large size without causing definite localizing symp-

toms. The only constant finding is increased intracranial pressure with its usual train of symptoms. In the cases reviewed mental changes due to frontal tumors were not infrequent. As only one gumma of the brain was found at operation in a period of more than thirty years, operation was never withheld in the presence of a positive blood or spinal fluid Wassermann reaction when definite symptoms of tumor were apparent. Frontal tumors are apt to cause neighborhood symptoms because of encroachment on other areas.

In the cases of tumor in the precentral area there was evidence of subjective or objective weakness. Jacksonian convulsions with an associated monoplegia or hemiplegia in a case with increased intracranial pressure in the absence of cuts in the visual field probably indicate a tumor involving the precentral gyrus.

The localization of temporal fibroblastomata especially on the right side may be almost impossible even when the patient has all of the signs and symptoms of increased intracranial pressure. Hypertostosis of the skull is relatively frequent in this situation. When there is a cut in the visual field the differentiation of tumors of the temporal and occipital lobes is aided by the fact that in cases of tumor of the occipital lobe central vision is always preserved whereas in cases of tumor of the temporal lobe it may be lost. In the presence of a homonymous hemianopia with weakness and aphasia of a motor or auditory type the diagnosis cannot be questioned.

Of the cases reviewed, the parietal lobe was involved in only eight. Loss of stereognostic sense was a sign of great importance. The intracranial pressure may be very high or very low. The tumors frequently give rise to motor symptoms because of their encroachment on the adjacent areas.

In the nine cases of occipital lobe tumors localization was nearly impossible except when field defects were present. The nature of the field defects depends on the position of the tumor. A tumor growing medially and low down in the occipital region so that it soon compresses or invades the striate area produces a distinct hemianopia from the onset, whereas a tumor which compresses the occipital lobe on its lateral aspect is prone to cause a field defect that is more irregular. Besides field defects, tumors in this region may give rise to cerebellar symptoms due to pressure through the tentorium.

To explain the preponderance of tumors in the anterior portion of the brain an increased number of arachnoid villi may be hypothesized but this has not yet been proved. Arachnoid villi are frequently found in the midline, and many of them are adherent to the falx.

Grossly the tumors look much alike. They have a thin fibrous enveloping capsule. They are usually rounded, but have a lobulated surface. Frequently they are cystic, and most of them have a very adequate blood supply. As a rule they are adherent to the dura, but they do not penetrate the underlying pia which they push before them. The cut surfaces vary greatly, and the microscopic picture may be as variable as that of the gliomata. Overlying hyperostoses are of great aid in the diagnosis. The mode of their formation is not definitely understood.

It is now generally accepted that these tumors are derived from the arachnoid. Whether they are derived from mesothelial cells or from fibroblasts is a matter of dispute. The authors favor calling them "meningeal fibroblastomata" because they attribute them to fibroblasts. JOHN W. EYRE, M.D.

Argüelles, R., and Send, J. A.: Orbito-Ocular Changes in Fractures of the Skull (Alteraciones orbito-oculares en las fracturas craneales). *Semin Med.*, 1933, 21, 785.

Orbito-ocular changes are so common and of such importance in cases of fracture of the skull that an ophthalmoscopic examination should be made in every case of head injury.

The most serious lesions from the standpoint of their effect on vision are lesions of the optic nerve and the pulsating exophthalmos due to aneurism of the carotid artery in the cavernous sinus.

Fractures of the orbit may be either direct or indirect; that is, they may affect the orbit alone or radiate from fractures of the anterior middle, or posterior facial fossae. They are seldom the result of bullet wounds of the skull.

The eye symptoms of skull fractures may be classified as follows:

1. Visual, such as amblyopia and amaurosis due to lesions of the optic nerve.
2. Motor such as paralysis of the eye muscles resulting from injury to the muscles or to the nerves supplying them.
3. Sensory such as anesthetics, neuralgias, and trophic lesions resulting from lesions of the ophthalmic branch of the trigeminal nerve.
4. Mechanical, such as extravasations of blood in the orbit or conjunctiva, exophthalmos, exophthalmos, and pulsating exophthalmos.

The authors are of the opinion that in pulsating exophthalmos the aneurism of the internal carotid artery is produced by a spicule of bone introduced into the cavernous sinus and injuring the wall of the artery either momentarily or slowly.

Knowledge of the anatomy of the optic nerve and its canal is necessary for a thorough understanding of lesions of the optic nerve and the mechanism by which they are produced. Among the mechanisms are:

1. Tearing of the bundles of optic nerve fibers by transient or permanent diastasis of bone.
2. Penetration of the optic nerve by a spicule of bone.

3. Pressure on the nerve by a fragment of bone.
4. Pressure on the nerve by hemorrhage resulting from injury to one of its vessels.

5. Subarachnoid hematoma.
6. Detachment of the nerve from the eyeball at the cribriform foramen.

The visual symptoms (usually accompanied by other symptoms of fracture of the skull) differ with the lesion of the nerve. They include:

1. Immediate and incurable amaurosis due to crushing or tearing of the optic nerve.
2. Immediate amaurosis due to a hematoma in the nerve sheath which is followed by partial recovery.

3. Early amaurosis which soon disappears because of early absorption of a hematoma, but later recurs because of a hyperostosis or a scar in the meninges which fixes the nerve in the skull.

When a certain degree of vision remains it is usually restricted to a limited area of the fundus. Various types of lesions are found in the fundus, but are not considered typical. In cases of optic nerve lesions the behavior of the pupils is of importance.

The prognosis in these cases of optic nerve injury is generally poor. It is good in only 25 per cent of the cases, and is fair in another 25 per cent.

In the presence of injuries to the eyeball the diagnosis is difficult. However, examination of the eyeball, especially of the pupil and fundus, and roentgenograms of the orbit and optic canal are of great aid.

Treatment is very unsatisfactory. Worms has recently advised decompressive trephination of the optic canal by the orbital route in cases of hematoma of the nerve sheath. The authors have found this procedure harmless, but consider the operative field too deep and restricted. However they are of the opinion that it is indicated in cases of neuritis due to sinusitis as theoretically it is more satisfactory than opening of the sphenoidal sinus.

The authors report three cases of amaurosis associated with fracture of the skull. In two, the injuries were sustained in an automobile accident and in one from a blow over the orbit. In all of the cases the trauma was followed by loss of consciousness, vomiting, other symptoms of fracture of the skull, and immediate loss of vision. In one case Worms decompressive trephination was attempted, but was discontinued because the operative field was too limited for safety. In all of the cases roentgenograms showed the optic canals to be pathological.

In the first two cases there was complete loss of vision with no improvement. In the third case there was pulsating exophthalmos with partial loss of vision and symptoms typical of aneurism of the carotid artery in the cavernous sinus. Vision was preserved only in an inferomedial sector. Micro-scleritis of probably toxic origin was found, but the Wassermann reaction was negative. All of the symptoms improved slightly under treatment by rest, periodic

compression of the carotid artery in the neck and weekly injections of a sterile solution of 10 per cent gelatin.
W. H. MARRIOTT, M.D.

Reichert, F. L.: Tympanic Plexus Neuralgia; True Tic Douloureux of the Ear or So-Called Geniculate Ganglion Neuralgia Cured Effectively by Intracranial Section of the Glossopharyngeal Nerve. *J. Am. M. Ass.* 1933 G, 1744.

The author reports in detail a case of partial or Jacobson's plexus tic douloureux of the left glossopharyngeal nerve. The patient was a woman telephone operator thirty-one years of age who complained of severe pain in the left ear. Eleven years previously she had been obliged to discontinue the use of ear phones for a short time because of pain in the same ear. The recent attack began with a sensation of drawing and discomfort in the upper part of the face on the left side, which gradually extended from the cheek to the forehead and occipital region. About four months later after an attack of coryza, sharp stabbing pains occurred deep in the left external auditory canal. Following injection of the sphenopalatine ganglion with procain hydrochloride, the paroxysms of pain were relieved for twelve days. At the end of that time the pain recurred and additional injections were without benefit. The patient also experienced itching of the upper anterior wall of the left auditory meatus aching pains in the left side of the face and nose, eyeball and parieto-occipital area, and sensitiveness in the mastoid and pretragal regions. The attacks occurred spontaneously. During the paroxysms salivation was absent.

All possible foci of infection were eradicated without benefit. Injection of the sphenopalatine ganglion and the left sympathetic chain at the seventh cervical and the first and second thoracic vertebrae failed to give relief.

The pre-operative diagnosis was geniculate ganglion neuralgia or geniculate tic douloureux.

Under local anesthesia the left seventh, eighth, ninth and tenth nerves were identified by a unilateral cerebellar approach. Slight manipulation of the bundle containing the seventh and eighth nerves caused pain in the auditory canal localized to the cartilaginous portion of the anterior wall of the external auditory meatus. When the ninth nerve was touched the patient shrieked with pain. This nerve was touched four times and the paroxysmal pain in the ear identical with the tic was reproduced each time. After section of this nerve the patient fell asleep. The tic pain was referred to the bony part of the anterior wall of the external auditory canal.

Four months after the operation the patient still remained free from symptoms. Anesthesia of the left ear or its external canal could not be demonstrated after the operation. Sensation was lost over the left soft palate and over the pharyngeal wall from 1 cm. within the eustachian tube to the tip of the epiglottis and over the posterior third of the tongue where taste was also absent.

Studies were conducted on the salivary secretion in this case, two other cases with intracranial division of the ninth nerve, and four cases with avulsion of the chorda tympani distal to the facial nerve. The author was convinced that the secretory fibers of the salivary glands accompany both the seventh and the ninth nerves.

He concludes that there are at least two types of neuralgia or tic douloureux of the glossopharyngeal nerve. The more commonly described type is characterized by paroxysmal attacks of lancinating pain which usually starts in the tonsillar region or the base of the tongue, frequently radiates to the ear, and is often accompanied by salivation and induced by eating, talking, swallowing or other movements of the pharynx and tongue. The more rare type, that in the case reported in this article, is a neuralgia of the tympanic branch of the glossopharyngeal nerve which in the past has been erroneously regarded as a tic of the sensory filaments of the seventh nerve, commonly known as geniculate ganglion neuralgia. It is characterized by paroxysms of stabbing pain in the external auditory meatus which are often associated with other pains in the face and postauricular region, but are not induced by movements of the tongue or pharynx and are not associated with salivation.

Intracranial division of the glossopharyngeal nerve had cured both types.

ROBERT ZOLLINGER, M.D.

MISCELLANEOUS

Leary, T. and Edwards, E. A.: The Subdural Space and Its Linings. *Arch. Neurol. & Psychiat.* 1933 xxi, 691.

The authors carried out a comparative investigation of the linings of the serous cavities and the subdural space. Their interest was aroused when they discovered great differences between the functions and the reactions of the arachnoid and the dura in the study of a group of cases of subdural hemorrhage.

They removed sheets of the lining layer of cells from the surfaces of the various serous cavities. This proved to be a very satisfactory and dependable method of studying the cells. They found the dura to be unlike the other serous spaces. The scrapings from the dura had the microscopic appearance of fibroblasts and showed varying degrees of fibril formation. Good specimens of the pia arachnoid obtained from the region of the candelae equina showed a continuous layer of flattened cells with oval vesicular nuclei. The authors believe that the origin of the membranes lining the subdural space probably explains the differences in the character of the two surfaces. They review experimental work which indicated that the pia arachnoid is of ectodermic origin. They conclude that this explains why the pia-arachnoid is relatively impermeable and why it differs from the mesothelium covering organs in serous spaces. They believe that the

formation of the subdural space embryologically might be explained by the separation of the surface covered by these cells from a layer of mesenchyma which becomes the inner layer of dura.

They account for the relative simplicity of the dura by the theory that the skull with its lining dura forms an articulation with soft tissues, the brain and its covering, the pia-arachnoid. This would explain the readiness of the dura to produce adhesions when the arachnoid barrier is injured. The authors compare the dura with its naked fibroblastic cells to exposed connective tissue surfaces prepared to form granulations and adhesions unless restrained. On this basis not only the formation, but the persistence, of the subdural space makes it necessary to suppose an opposing surface covered by cells capable of preventing closure of the space by growth from the dura.

The authors conclude that the dura is lined by fibroblastic tissue, and that the subdural space does not correspond to the serous spaces. They believe that the arachnoid is probably covered with cells of ectodermal origin.

ROBERT ZOLLINGER, M.D.

Tidswell, F., and Sear H. R.: Neuroblastomas: Some Experiences at the Royal Alexandra Hospital for Children. *Australia & New Zealand J Surg* 1933 11, 366.

This article is in two parts. In the first part Tidswell reports on the symptoms and pathological

findings in two cases of neuroblastoma and in the second part Sear reports on the roentgenological aspects of eight cases.

The condition occurs in young children and is usually fatal within a year. The symptoms are due to the effects of the primary malignant adrenal tumor and its metastases. This tumor was formerly classed as an adrenal sarcoma, but is now called neuroblastoma. It produces a large abdominal mass. Secondary deposits in the skull produce a characteristic X-ray appearance due to bony subdural, and subperiosteal masses and cause proptosis and ecchymoses from invasion of the orbits. In the extremities, they produce a characteristic X-ray picture due to the invasion of bone and marrow. They also cause weakness with inability to walk, anemia, and cachexia. They invade and enlarge the lymph glands. As a rule the condition is accompanied by a mild fever and occasionally by mental symptoms such as irritability and restlessness.

Roentgenography of the skull discloses a worm-eaten appearance of the calvarium and orbits, widening of the sutures, the presence of masses on the cranial bones, and a fine trabeculation extending into the cranial bones from the periosteum. Roentgen examination of the long bones shows a patchy worm-eaten appearance throughout with, at later stages, uniformly transradiant areas of varying size and periostitis along the greater part of the shafts of several bones.

DAVID JOHN LEONARDO, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Lee B J: End Results in the Treatment of Cancer of the Breast by Radical Surgery Combined with Pre Operative and Postoperative Irradiation. *Am J Surg.*, 1933 22, 425

The author discusses carcinoma of the breast on the basis of 217 proved cases operated upon in the period from 1916 to 1927.

The incidence of the condition was highest 21 per cent, between the ages of forty five and fifty years, and next highest, 20 per cent, between the ages of forty and forty five years. Twenty five per cent of the patients were forty years of age or younger. The youngest patient was twenty-seven years old.

One third of the tumors were located in the upper outer quadrant of the breast and half that number were in the central segment. The sites involved next most frequently were the upper central and upper inner segments. Practically two-thirds of the tumors were in the upper segments.

In a much larger series of cases the first symptom noted by 75 per cent of the patients was a lump in the breast, but in 1 of 15 cases in this series the first symptom referable to the breast was a sticking needle like pain. In 5 per cent of this series there was a diffuse enlargement of the breast. The next most common first sign was retraction. Not infrequently the first sign noted by the patient was a lump in the axilla. In 1 of every 70 cases the first sign was bleeding of the nipple.

In about 1 per cent of cases the carcinoma is of the inflammatory type and must be differentiated from abscess of the breast. Carcinoma of this type is a highly cellular rapidly growing very malignant tumor. In 0.6 per cent of the cases the first sign of the condition was swelling of the arm. About 10 per cent of cases of mammary carcinoma even when recognized early, are probably hopeless from the surgical standpoint from the outset. However in many of the surgically hopeless cases the tumor is radiosensitive. Therefore irradiation should be used more promptly and frequently. In 90 per cent of the cases early surgical treatment will yield good end results.

The author regards a case as operable when the tumor is not fixed to the chest wall. When there are wide multiple cutaneous nodules around the original site of the tumor, when the arm is swollen or painful and there is extensive axillary metastasis, when the supraclavicular nodes are invaded, and when there is distant metastasis to the chest or bones, the condition is inoperable and radical amputation should be withheld. In cases of advanced mammary carcinoma radical surgical procedures shorten life and are apt to bring discredit to surgery. The practice

of obtaining a specimen for histological examination by incision into the tumor is undesirable. A small specimen may be obtained safely by the aspiration or the punch technique.

In the 217 cases reviewed, local excision was done 19 times prior to radical mastectomy. In 7 cases the radical surgery immediately followed the local removal. In 12 cases the local excision preceded the radical procedure by from one day to three weeks. The delay did not seem to influence the prognosis. The tumor should be widely excised, not cut into.

After operation in the author's cases the arm is kept at a right angle to the trunk. Active and passive motion of the arm is encouraged at the end of twenty four hours. The patient is allowed out of bed after four or five days. The drains are removed on the third day and the sutures on the sixth or seventh day.

The present plan of pre-operative irradiation consists in giving 650 roentgen units using high-voltage X rays over the breast and drainage areas and giving treatments on each of two successive days. Operation is performed from two to four days after the last irradiation. The tumor irradiated in this manner will not show the histological changes which formerly occurred during the delay of six weeks, but the dose is delivered and the cells are affected biologically.

Postoperative irradiation is given four weeks after the operation, when the wound is firmly healed. A high voltage cycle each treatment consisting of 750 roentgen units, is given over the breast and drainage areas on successive or alternate days. If the operation showed the lymph nodes to be uninvolved, only 1 cycle is given. If the lymph glands were involved, 1 or 2 subsequent cycles are given preferably in 1 treatment each over the upper anterior, upper posterior and lateral axillary regions. The irradiation is directed toward the supraclavicular area where the first metastasis is likely to occur.

Of the 217 patients treated by radical mastectomy plus pre-operative and postoperative irradiation, 41 per cent were alive and well five years after the treatment of 130, 35 per cent were alive and well after seven years and of 75, 22 per cent were alive and well after ten years.

The prognosis was most favorable in cases of tumor in the upper inner segment of the breast. It was almost equally good when the tumor occupied the central breast segment. It was poorest when the tumor was in the upper central segment or the lower inner or lower outer segment.

Of the patients forty years of age or under, 27 per cent were alive and well at the end of five years, whereas of those over forty years of age, 45 per cent were alive and well at the end of five years.

Of 76 patients without involvement of the axillary lymph nodes, 72 per cent were alive and well at the end of five years, whereas of 103 patients with involvement of these nodes, only 23 were alive and well at the end of five years. Of the 7 patients who were pregnant at the time of the discovery of the carcinoma, none lived for five years and only 1 survived for three years.

The postoperative mortality was 0.9 per cent. The author's clinical index of malignancy is discussed in detail, and figures are given to show the dependability of histological grading of the tumors, which was done in 85 cases. EARL O. LATIMER, M.D.

TRACHEA, LUNGS, AND PLEURA

Proust, R.: Section of Intrapleural Bands and Adhesions in the Treatment of Pulmonary Tuberculosis (La section des brides et le détachement des adhérences intra-pleurales dans le traitement de la tuberculose pulmonaire). *J de chir* 1933 XII, 229.

Since Jacobaeus introduced his thoracoscope for the sectioning of intrapleural adhesions in 1913 experience has demonstrated the superiority of the use of this instrument over thoracotomy and parietal separation of the pleura.

In a certain number of cases of pulmonary tuberculosis pneumothorax proves efficacious because adhesions between the lung and parietal pleura prevent cavities from collapsing. If the adhesions can be sectioned aseptically and without hemorrhage to allow effacement of the cavity, a cure may be anticipated.

The exact location of the bands or adhesions must first be established by means of a stereoscopic roentgenogram. After the topography of the lesions has been determined the chest wall is infiltrated with novocain, a skin incision is made, and the trocar of the thoracoscope is introduced. To avoid encountering the lung, the region is first explored with a blunt needle. The thoracoscope is then inserted and a general view of the cavity is obtained all of the important landmarks being identified. These landmarks have been carefully studied by Cova and are shown in his atlas.

For the accommodation of a cautery another trocar is introduced at the most favorable point for attacking the adhesions. To determine this point the chest wall is pressed upon by an assistant, the bulge being observed by the operator through the thoracoscope, or if the room is dark, the point of attachment of the adhesion is seen by transillumination as a bright spot on the chest wall.

The adhesions should be sectioned close to their parietal extremities because they frequently consist in large part of stretched lung tissue. Before they are attacked with the thermocautery the tissue is desiccated by a diathermy current. This obviates the formation of vapors which obscure the view. The preliminary desiccation is essential even when the electrical knife is substituted for the thermocautery.

Anesthesia is obtained by infiltrating the adhesion with a 1:200 solution of novocain.

Possible complications of the operation are pleural effusions, emphysema, and the formation of new adhesions. Effusion and emphysema are common and seemingly without an unfavorable effect. Adhesions should not re-form if care is taken to maintain the pneumothorax. When the combined diathermy and cautery technique is used, hemorrhage is rare.

ALBERT F. DEGRAAF, M.D.

Stegemann, H.: Narcysten Anesthesia for Operation on Patients With Lung Conditions, Especially for Thoracoplasty (Die Narcystenbetäubung bei der Operation Lungenkranke insbesondere bei der Thoracoplastik). *Schweiz*, 1932, v. 49.

The author calls attention to the lack of uniformity in the induction of anesthesia for operations on patients with lung conditions, and particularly for thoracoplasty. He states that in cases of lung disease, especially pulmonary tuberculosis, the induction of anesthesia requires great care. Minor procedures such as phrenico-steroids and limited rib resections should be performed under local anesthesia. Open separation of adhesions may also be done under anesthesia of this type. Of the major procedures in the surgery of the lung thoracoplasty is of greatest interest. The indications for this operation are reviewed, the social importance of the procedure is emphasized, and the results as shown by a few statistics are discussed.

In the induction of anesthesia special attention must be paid to the heart which has been damaged by tuberculous toxins. As the result of the decrease of the respiratory surface, the internal respiration is disturbed. Special precautions are necessary on account of the great danger of generalized spread of the tuberculous process from the aspiration of tuberculous material into parts of the lungs still uninvolved. Although as a rule a quite long sleep is desirable after a surgical procedure, in cases of lung disease the narcosis should be as short as possible in order that expectoration may take place immediately after the operation.

On first consideration, local anesthesia seems to have every advantage—absence of damage to the respiratory passages, assurance of expectoration in the first few hours after the operation, and absence of postoperative nausea and vomiting. However it has the great disadvantage of causing psychic shock. The author discusses the heretofore neglected problem of anoxia-association, especially in relation to thoracoplasty, and calls attention to the toxic manifestations of local anesthesia which increase the operative shock.

In a comparison of the various anesthetics used for the induction of general anesthesia narcysten was found to be the best general anesthetic as yet available. However, its use received quite a setback in Germany because of the occurrence of several explosions in the absence of an open flame. The author explains the accidents, describes im-

improvements in the apparatus by which narcysten is administered, and calls attention to the fact that ether is also explosive.

Narcysten anesthesia has many decided advantages over the types of general anesthesia previously used. According to the replies to a questionnaire sent out by Schroeder its mortality is the lowest. The beginning of the anesthesia is pleasant. An important characteristic is the rapid, almost immediate awakening of the patient after removal of the mask. Lung complications due to the anesthetics are practically unknown. As the patient awakens immediately after removal of the mask, he is able to clear his lungs freely by coughing. In avertin anesthesia there is a long post-operative sleep which prevents coughing. Moreover in contrast to narcysten anesthesia, the amount of circulating blood is markedly decreased. External respiration has already been decreased by the plastic operation, and by reducing the circulating blood the avertin decreases the internal respiration. Both reductions together are dangerous. In narcysten anesthesia the danger is reduced by the increase in the circulating blood. Pernoxon and somnifene share the disadvantages of avertin. Ether does not compare favorably with narcysten, as the well known irritation of the bronchial mucosa, the exacerbation of tuberculous lesions, the frequent toxic vomiting and the prolonged period of discomfort associated with its use are absent in anesthesia induced with narcysten. Moreover, narcysten does not cause disturbances of the cellular structures. The use of chloroform has practically been abandoned. The author has not used chloroform for three and a half years and has not missed it in the induction of more than 10,000 anesthetics. He states that since he has abandoned it the operating room has been a great deal more tranquil. For the weakened, toxin-saturated patient with pulmonary disease, he decidedly opposes the use of chloroform as it is the most poisonous of all anesthetics.

The anesthesia comparing most favorably with that produced by narcysten is nitrous oxide anesthesia. The chief advantage of nitrous oxide is its inability to explode. However this advantage over narcysten is offset by several disadvantages which are not possessed by narcysten. The small anesthetic potency and the limited anesthetic range of nitrous oxide as compared with acetylene, which necessitate pushing the anesthetic to asphyxial limits are sources of great danger. The addition of ether is an illogical compromise since, to prevent cyanosis and asphyxia, the respiratory system is thereby subjected to the well known and feared irritation of the bronchial mucosa and the unfavorable influence on latent tuberculosis produced by ether. Narcysten induces satisfactory anesthesia in all cases without the aid of ether.

Zaaijer's objections to narcysten because of the danger of explosion are answered. The author used narcysten anesthesia for his last 94 thoracoplasties. All except 3 of the operations, which were done for

empyema cavities, were performed for tuberculosis. Narcysten was found to be the only gaseous anesthetic which alone was sufficient for the induction of complete anesthesia and did not require the additional use of ether or chloroform. By its use the patient received all of the advantages of gas anesthesia, viz., rapid induction of the anesthesia, the avoidance of psychic shock, the induction of deep anesthesia without the use of other anesthetics, quick return of consciousness after removal of the mask, almost complete absence of unpleasant sequelae such as nausea and vomiting, the elimination of shock by the increase in the blood pressure, and absence of irritation of the respiratory tract, cyanosis, and asphyxia. STEIGEMANN (Z)

McEachern, J D: *The Treatment of Acute Empyema in Infancy and Childhood; With a Report of Seventy Five Cases Treated by Closed Drainage.* *Brit J Surg.*, 1933, 22, 653

The treatment of empyema by the suction and irrigation method described by the author requires more attention to detail than treatment by rib resection. However it decreases the mortality, shortens the period of illness, renders the patient more comfortable and leaves a more normal and better functioning chest wall.

The shortening of the time of drainage is of considerable economic value. If six weeks is the average time of drainage after rib resection, the use of the closed method cuts the time in half.

For practical purposes the empyema cavity can be rendered sterile by the use of Dakin's solution. The use of Dakin's solution does not increase the incidence of bronchial fistula.

The method is excellent for the treatment of encysted empyema. SAMUEL KAHN M.D.

Alexander J: *Apparently Common Purulent Pleuritis Ultimately Recognized as Tuberculous (Pleuritis purulenta chronica banalis en apparence tardivement reconnue de nature tuberculeuse)* *Arch. int. chir. de Pappas respir.* 193, viii, 1

The author reports eight cases which show the almost any type of purulent pleurisy whatever the infecting bacterium, may be a superinfected tuberculous effusion even though its tuberculous nature (suggested by the prolonged fistulization) is not proved by the history or the final clinical, roentgenological or histological findings.

When there is reason to suspect the cause, repeated microscopic examination of the granulation tissue should be made. Cases show that the histological evidence of tuberculosis may not appear until late in the disease.

In three of the author's eight cases and antiseptic irrigation, followed by closure of the pleural fistula and a Schede thoracoplasty was

The end results were excellent. Of the seven patients who could be traced, four were completely cured, the residual cavity having disappeared. The three others were in good condition, but in one of them the operative wound was still open and in two it was in the process of healing. Of the five patients who were treated by thoracoplasty two were healed and three were completely cured.

The results in this small series of pleural fistulae were better than those usually obtained in evident superinfected bacillary effusions. The difference in the gravity of the condition is probably due to the fact that fistulizing pleural effusions of the type under discussion behave from the surgical viewpoint more like infectious empyemata than like tuberculous effusions.

ELLA M. SALAMONSON.

ESOPHAGUS AND MEDIASTINUM

Barrett N. R.: Diverticula of the Thoracic Esophagus. *Lancet* 1933 cccxlv 609.

Diverticula of the esophagus occur most commonly in the upper part of the esophagus and comparatively rarely in the thoracic part. Diverticula of the thoracic esophagus are of three main types (1) traction diverticula, (2) pulsion diverticula, and (3) traction-pulsion diverticula. As a rule the diverticula are single.

Diverticula of the thoracic esophagus are of little clinical importance as they seldom give rise to symptoms and are usually discovered only by chance. Symptoms, when present usually consist of difficulty in swallowing and a feeling of fullness in the chest. Regurgitation of food may also occur.

Rarer symptoms are increased salivation, dyspnea, cardiac pain, palpitation, and cough.

A certain diagnosis is made by X-ray examination after a barium meal. X-ray examination will show the position and extent of the diverticulum.

Few diverticula of the thoracic esophagus require treatment, but in cases of large diverticula with symptoms surgical treatment is advisable as the diverticulum may cause obstruction or perforation into the mediastinum.

The author reports the case of a woman fifty-nine years old who had had symptoms of a diverticulum of the thoracic esophagus for two years. X-ray examination showed a large pouch with a wide neck at the level of the seventh rib. Two days before operation artificial pneumothorax was induced on the right side. At operation, ether was given by the intratracheal method and a bougie passed down the esophagus into the diverticulum. The skin and intercostal muscles were divided along the sixth interspace and excellent exposure gained by means of rib spreaders. By palpating with the bougie the diverticulum was easily identified. The parietal pleura was incised and the diverticulum isolated by blunt dissection clamped, and removed with the diathermy knife. The esophagus was closed with two layers of catgut and the suture line covered with a flap of pleura. The thorax was closed without drainage. For nine days the patient was fed by means of a tube passed through the nose into the stomach. Convalescence was uneventful.

Six months after the operation a roentgenogram of the esophagus showed no abnormality whatever.

J. DANIEL WILLIAMS, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Meillère, J. An Acute Abdominal Syndrome of Peritoneal Irritation With Moderate But Progressive Exudation of Aseptic Fluid—Hæmoperitoneum (Sur un syndrome aigu d'irritation péritonéale par épanchement modéré et progressif de liquide aseptique—hémopéritoïne) *Presse méd.*, Par 1933 xli, 605

Inundation of the peritoneal cavity by aseptic fluid, most frequently blood, is manifested clinically by various syndromes. The variation in the symptoms is explained, no doubt, by differences in the causative lesions and the amount and rapidity of formation of the fluid. The author has observed cases of gradual inundation of a subacute type. The symptoms of this type include nausea, intestinal obstruction, moderate distention of the abdomen, defensive muscular rigidity flatulence, fatigue, pale but not peritoneal faces and a moderate fever. Four cases are reported in detail—three of hæmoperitoneum and one of rapidly forming ascites.

From a study of these cases Meillère concludes that the most typical cases are those in which the traumatic element is reduced to the minimum. As a rule the patient is seen one two or three days after the onset of the symptoms. The first symptom is sudden pain. This subsides, and after a quiet interval of varying duration a state of abdominal malaise develops insidiously. The latter is characterized by dull pain, nausea, a sensation of distention, and constipation. Occasionally vomiting occurs. In true acute peritoneal infection at this stage there would be repeated violent attacks of vomiting with high fever, a rapid pulse dryness of the tongue peritoneal faces and painful contraction of the abdominal wall. The pain and contraction of acute appendicitis are more localized. The syndrome differs also from that of acute intestinal obstruction. In cataclysmic inundation of the peritoneal cavity there is severe shock or acute anaemia. In the syndrome under discussion the pain, shock, and local signs of hemorrhagic pancreatitis and mesenteric thrombosis are absent.

The syndrome discussed is usually due to hæmoperitoneum. As a rule the anaemia remains slight and diminished dullness is absent because the exudation is moderate and progressive. The symptoms may be due to a subacute postoperative hæmoperitoneum or a residual hæmoperitoneum, especially following splenectomy for rupture of the spleen or castration in a case of tubal pregnancy. However the most common cause is hæmoperitoneum due to the rupture of a viscus. The author believes that the clearest syndrome of hæmoperitoneum is produced by the spontaneous rupture of a pathological spleen.

In traumatic rupture of the spleen the problem becomes more complex. Traumatic rupture of the spleen may be followed by profuse cataclysmic hæmorrhage, abundant hæmorrhage, moderate hæmorrhage with moderate peritoneal inundation, or slight localized hæmorrhage. In cases of profuse cataclysmic hæmorrhage there is acute anaemia. The second type of hæmorrhage is the well known classical form with abundant and rapid peritoneal inundation. The syndrome discussed in this article is caused by the gradual progressive peritoneal inundation. Slight localized hæmorrhage produces a hematoma in the splenic region. Intraperitoneal hæmorrhage due to rupture of an extra-uterine pregnancy is manifested by analogous clinical syndromes.

Independently of the anaemia, hæmoperitoneum causes peritoneal irritation with sensitivity followed by peritoneal defense and intestinal paralysis. Similar syndromes may be produced by a gradually developing ascites. EDWIN S. MOORE.

Turner P: Hernioplasty *Guy's Hosp Rep Lond.* 1933 lxxviii 233.

Operations for the radical cure of inguinal hernia are of the following three types

1. Herniotomy or simple excision of the sac.
 2. Herniorrhaphy in which in addition to excision of the sac, an attempt is made to strengthen the inguinal canal by suturing. The method most commonly employed is Bassini's operation or a modification of it.
 3. Hernioplasty in which the weakened inguinal canal is repaired by a plastic operation.
- The author describes a method of hernioplasty which he has used in sixty five cases treated in a

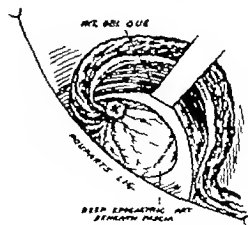


Fig 1 The opening in the transversalis fascia defined after removal of the sac. The external oblique is not shown.

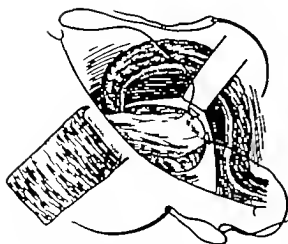


Fig. 3. The flap of fascia has been drawn into the inguinal canal by traction on the sutures.

period of three years. The essential feature is the use of a pedicled flap of fascia lata with its base at Poupart's ligament to diminish the size of the opening and strengthen the fascial boundary of the canal. This flap is turned upward into the inguinal canal beneath Poupart's ligament and sutured to the margins of the gap which were carefully defined at an earlier stage of the operation.

J. THORNTON WILKINSPOON, M.D.

GASTRO-INTESTINAL TRACT

Ralford, T. S.: Lymphoblastomata of the Gastro-Intestinal Tract. *Arch. Surg.* 1933, xlv, 813.

The problem confronting pathologists with regard to lymphoblastomata of the gastro-intestinal tract is twofold: (1) to establish a suitable working classification, and (2) to recognize the grade of malignancy. For these purposes the author made a study of forty-five lymphoblastomata of the gastro-intestinal tract which were observed in the Surgical Pathological Laboratory of the Johns Hopkins Hospital, Baltimore.

Lymphoblastomata occur most frequently in the stomach, small intestine, and colon. The age curve shows two peaks, one in the first decade and the other a higher peak, in the fifth decade. The average age of the patients whose cases are reviewed was forty-one years. The tumors are about twice as frequent in males as in females, and about seven times more frequent in white persons than in negroes.

It is difficult to distinguish lymphoblastomata from carcinomata clinically, but the former are characterized by an insidious onset without acute pain, severe wasting, or secondary anemia. The presence of a moderate degree of fever and the absence of early symptoms of obstruction are

strongly suggestive of a tumor of lymphoid origin. The characteristic gross change produced by a lymphoblastoma is an aneurismal dilatation of the bowel, while that produced by a carcinoma is a stenosis. The typical cytological form of the lymphoblastoma is a round cell resembling the cells of the lymphoid series. On the basis of the cells from which they arise, lymphoblastomata may be divided into two main groups, the lymphocytomata and the reticulomata.

The majority of lymphoblastomata are malignant and the remainder must be considered potentially malignant although it is frequently impossible to distinguish the malignant characteristics. The tumors of the reticulum-cell type are the more malignant. Both types are frequently confused with benign inflammatory lesions such as those of tuberculosis and syphilis.

The prognosis of gastro-intestinal lymphoblastomata is poor because the diagnosis is made late.

The treatment of choice is surgical resection combined with irradiation.

J. THORNTON WILKINSPOON, M.D.

Morton, C. B.: Peptic Ulcer: Results of Medical and Surgical Treatment of Patients in Rural Districts and in Small Towns. *Arch. Int. Med.* 1933, li, 930.

Morton reports on the results obtained in 886 cases of peptic ulcer in rural patients treated in the period from 1918 to 1928. In 220 of the cases the ulcer was in the duodenum and in 66 in the stomach. The most frequent complication was hemorrhage, which occurred in 25 per cent of the cases. One hundred and ninety-six (68.6 per cent) of the patients were treated medically and 60 (31.4 per cent) were treated surgically. Surgical therapy was advised in 16.3 per cent additional cases, but was refused. Six patients died while under medical treatment, and 8 of the 60 patients treated surgically died while in the hospital. The remaining 272 patients therefore included 200 treated medically and 82 treated surgically. The results after from two to twelve years were determined in 164 cases. They were classified as excellent, good, fair or poor on the basis of the symptoms, dietary limitations, and the use of alkalis.

Of 33 traced patients who had been treated for gastric ulcer 25 were treated medically and 8 were treated surgically. Of the 25 treated medically 3 subsequently died of carcinoma of the stomach and 3 died of unspecified causes. Of the 10 survivors, slightly more than half reported satisfactory results. Of the 8 patients treated surgically, 1 subsequently died of an unknown gastric disorder but all of the 7 survivors reported satisfactory results.

Of 131 traced patients who had been treated for duodenal ulcer 85 were treated medically and 46 surgically. Of the 85 treated medically 2 subsequently died of ulcer, 1 died of some other condition, and 1 died of an unknown condition. Of the 79

survivors, slightly fewer than 50 per cent reported satisfactory results and 6 had had subsequent surgical treatment for persistent symptoms. Of the 46 treated surgically 2 died subsequently of an unspecified condition and 2 of a condition other than ulcer. Of the 42 survivors, more than 75 per cent reported satisfactory results. Three had developed a gastrojejunal ulcer.

In rural patients the results of the medical management of peptic ulcer were considerably less satisfactory than the results of surgical treatment. To obtain satisfactory results, those treated medically were obliged to adhere much more strictly to dietary regulation and the use of alkalies than those treated surgically.

SAMUEL J. FOOZEKSON, M.D.

Sinclair N.: A Case of Diffuse Polyps of the Stomach. *Brit J Surg* 1933 xx, 645

Diffuse polyps of the stomach is relatively rare, only 84 cases having been recorded in the literature to date. It is characterised by the presence of numerous sessile or pedunculated polyp distributed over the gastric mucosa. Balfour states that it was encountered only once in 800 operations for gastric lesions performed at the Mayo Clinic.

The case reported by Sinclair was that of a woman fifty-seven years of age who, for fourteen years, had suffered from attacks of indigestion characterised by severe epigastric pain of a burning nature which was made worse by the ingestion of food. At first the attacks had been separated by intervals of freedom from pain extending over many weeks, but recently they had become more frequent and vomiting and diarrhoea had supervened. The vomiting and diarrhoea had occurred daily. Every meal had been vomited. The vomitus was of a light color, small in quantity, odorless, and free from blood. The stools were loose and dark. For three months there had been a steady loss of weight.

The patient was thin and muscular and had a sallow complexion. The blood pressure was 110 systolic and 80 diastolic. Rectal examination was negative. The erythrocytes numbered 5,500,000 per cubic millimeter. The Wassermann reaction was negative. The barium meal showed a well marked hourglass deformity of the stomach. The loculi were large and had regular contours. The channel between them was very narrow. A diagnosis of simple hourglass stomach was made.

Operation performed under general anaesthesia disclosed a well developed hourglass stomach. The constriction lay considerably above the middle of the organ, and although it was narrow was not particularly indurated. Both loculi were large. The stomach walls were considerably hypertrophied. The across presented a normal appearance, and there were no enlarged glands in the omentum. Except for a general visceroperiosis, the remainder of the abdominal viscera were normal.

A partial gastrectomy by the Balfour method was performed, approximately two-thirds of the stomach being resected. Section of the stomach

was made through the proximal loculus $1\frac{1}{2}$ in above the constriction. On division of the stomach the gastric mucosa was found studded throughout with minute sessile polyp. The mucosa of the duodenum and jejunum was normal.

The patient was discharged from the hospital after four weeks feeling better than she had felt for many months. She was able to eat without discomfort, the vomiting had ceased, and the bowels were acting normally. A test meal taken during the fourth week of convalescence showed total achlorhydria. Eight months after the operation the patient looked well, had gained weight and had a good appetite.

Microscopic examination of the specimen suggested that a chronic inflammation had produced polypoid thickening of the gastric mucosa. The duodenal mucosa was normal except that it was densely infiltrated with plasma cells and eosinophilic leucocytes. There was no evidence of malignant change in any of the sections examined.

The exact nature of the morbid process described still remains obscure. The tumors are generally referred to as 'adenomata.' They are covered by a single layer of columnar or cuboidal cells arranged in an orderly manner and limited by the muscularis mucosae. In many of the recorded cases there was evidence of chronic inflammation. That chronic irritation can produce polypoid growths in the stomach has been proved experimentally. In the Museum of the Royal College of Surgeons of England the specimen from the author's case is classified under the heading 'chronic hypertrophic gastritis.'

In Sinclair's opinion the sequence of events in his case was as follows. The patient had a gastric ulcer which healed and thereby produced a bilocular stomach. An unusual degree of chronic gastritis then developed in the distal loculus and led to thickening of the gastric mucosa and the formation of inflammatory polyps. The latter in turn caused progressive obstruction of the pylorus with consequent atony and more gastritis.

JOHN W. NIXON, M.D.

McIver, M. A.: Acute Intestinal Obstruction. Sixth Installment. *Am J Surg* 1933 xx, 811

Functional disturbances of intestinal motility may be the result of local or intra-abdominal disease or a reflex from some other lesion. Atonic paralysis may be caused by acute peritonitis or the passage of a renal stone. These changes may result from injury to the muscle or nerve plexus in the gut wall or inhibitory impulses carried over the extrinsic nerves. The mechanism may be even more complex as the same stimulus may at one time produce atony and at another time, spasm of the bowel.

The mechanism of peristalsis is complex and is probably a combined neurogenic and myogenic process. McIver believes that the rhythmic contractions and the peristaltic waves may depend upon different mechanisms, the former which is simpler and more primitive, depending upon the inherent

ability of smooth muscles to contract in a rhythmic manner and the more complicated and highly developed peristaltic wave depending upon the nervous element for initiation and propagation.

Processes outside the abdomen which abolish peristalsis occur as a result of impulses transmitted over the splanchnic nerves. Cutting of the splanchnics prevents such abolishment of peristalsis. Injuries and infections of the peritoneum itself may affect the gut musculature or ganglia within the gut or may be transmitted over the extrinsic nerves. Peritonitis may produce disturbance in bowel function mechanically through the production of adhesions and functionally by causing paralysis and atony of the intestinal canal as a result of injury to the neuromuscular structure of the gut. Functional inactivity of the gut not infrequently occurs following a prolonged mechanical obstruction, possibly because of interference with the blood supply and possibly because of the absorption of toxins. Functional ileus may occur after operation but under such circumstances is usually mild. Occasionally functional disturbance of the bowel may be so great as to simulate mechanical obstruction. At the Massachusetts General Hospital 9 such cases were admitted to the surgical ward in the period from 1918 to 1927. Six of the patients were over seventy years of age and 2 were infants less than one month old. McIver believes that the functional disturbance of the intestinal tract is probably due to the poor constitutional state of the patient. Other functional disturbances are spastic occlusions. In McIver's opinion, gas pains after operation are at least in part, localized spasms of the gut. The causative factors may be local injury to the muscle or nerve plexuses or foreign bodies in the bowel.

For the prevention of functional obstruction, especially in peritonitis, McIver recommends restriction of fluids by mouth. Care should be taken to keep the stomach from becoming distended with fluids and gas. In serious cases the fluid intake should be limited to sips of water or if the patient is vomiting no fluid should be given by mouth. If there is gastric dilatation, gastric lavage should be done. In all cases of peritonitis in which extensive trauma has occurred at operation, the liberal use of morphine postoperatively is a valuable prophylaxis against postoperative distention and functional obstruction. McIver advocates the administration of $\frac{1}{4}$ gr of morphine every three hours. In the presence of a suspected obstruction cathartics are contra indicated. Of more importance than evacuation in such cases is the passage of flatus. A low enema may rid the colon of imprisoned gas. Care must be taken not to give enemas too frequently, especially if the fluid is not expelled. Application of heat to the abdomen combined with the use of the rectal tube and the administration of morphine is an extremely effective and harmless way of getting rid of flatus and reducing distention. In cases of peritonitis the author advocates placing the patient in Fowler's position.

ARTHUR OGDEN, M.D.

Figure III G: Experimental Researches on Detachment of the Mesentery of Loops of Intestine Previously Wrapped with Omentum (Ricerche sperimentali sul distacco mesenterico di tratti di intestino qualche tempo prima avvolti nell'epiploon) *Sperimentale* 1933, lxxvii, 8.

Figurelli reports a continuation of his experiments on omental envelopment of the ileum isolated from its mesentery. In his previous researches the wrapping with omentum was done at the same time as the resection of the mesentery, whereas in the investigations reported in this article it preceded the resection by a considerable interval. The time at which it is done is of practical importance for if omental investment preceding resection of the mesentery will assure viability of the loop this method may be resorted to when, in resection of the mesentery as for tumor it is desirable to avoid resection of the intestine.

In six dogs a "muff" of omentum was wrapped around the free surface of an intestinal loop which varied in length in the different animals from 10 to 30 cm. The "muff" was then sutured with silk, and after from fifteen to twenty days the mesentery was resected. A dog in which a 30-cm. portion of mesentery was removed died of perforation, and another in which a 14-cm. portion was resected, died from volvulus. The rest, with resections of 10-, 12-, 16-, and 18-cm. portions, recovered well and were killed from twenty five to thirty days after the second operation. The operation and gross and microscopic findings are reported in detail.

In the cases with successful results the loop was somewhat shortened, tortuous, and alternately narrowed and dilated, depending on adhesions to the omental muff. In some places the latter formed a thick constricting mass sending broad fibrous bands with numerous dilated vessels into the intestinal wall whereas in other areas it was reduced to a thin, scarcely adherent layer and the intestine was dilated. Microscopically the intestinal wall showed more or less inflammation and fibrosis, but complete scleroses never occurred.

In Figurelli's earlier researches omental envelopment following mesenteric resection was never successful for stretches exceeding 12 cm. and even below that limit was sometimes of value only to prevent perforation and permit complete sclerosis of the intestinal wall. Comparison with the experiments reported in this article proved that omentoplasty before mesenteric resection gives better results. However even under the latter conditions, the lesions in the bowel wall and the tendency toward stenosis and kinking prevent complete assurance of success.

MARY ELIZABETH MORSE, M.D.

Exner F. B.: The Roentgen Diagnosis of Right Paraduodenal Hernia: Report of a Case with a Survey of the Literature. *Am J Roentgenol* 1933, xlix, 585.

Exner discusses the occurrence, anatomy and history of right paraduodenal hernia at some length,

tabulates ten cases reported since 1923, reviews the literature on the roentgen findings in the condition, and reports the clinical and roentgen findings in a case of his own.

He states that the roentgen diagnosis necessitates a careful and detailed examination of the gastro-intestinal tract including observation of the passage of a barium meal through the intestines. It depends largely on recognition of the possibility of such a condition.

The most characteristic sign is a clumped appearance of the intestinal coils as if they were contained in a bag. The coils cannot be displaced from this circumscribed mass by any amount of manipulation or a change in the patient's position. The axis of the ovoid mass of bowel loops is usually somewhat to the right of the midline of the body. When the patient is erect the corpus of the stomach tends to sag down to the left of the sac while the antrum and pylorus are held up in position. Loops of the small bowel tend to be absent from the pelvis. In all cases thus far reported the herniated bowel has shown some loss of motility, so that there is more or less delay in the passage of the barium through the sac. This stasis helps to render an unusually large part of the bowel visible at one time and thereby accentuates the characteristic appearance. The point of exit from the sac is sometimes manifested by an abrupt change in the caliber of the bowel as it emerges.

Differentiation from left paraduodenal hernia should usually be possible. In left-sided hernia the ovoid mass of bowel tends to lie more to the left side, and in right-sided hernia it tends to lie more to the right side, of the midline of the body. In left-sided hernia the stomach tends to ride high on top of the sac, while in right-sided hernia it tends to sag downward to the left of the sac. Differentiation from intestinal non-rotation can be made by bearing in mind the fact that in intestinal non rotation the caecum is usually reversed with the ileum entering it from the right. Certain rare abdominal anomalies, such as subtotal perforical herniae, might conceivably present confusing roentgen findings, but to date none has been reported.

ADOLPH HARTUNG M.D.

Kittelson J. A. The Treatment of Duodenal Fistula Including a Report of Two New Cases and a Report of a New Buffer Solution. *Surg. Gynec. & Obst.*, 1933 lvi 1056

The author reviews ninety four cases of duodenal fistula which he has collected from the literature since 1865. He records the type of lesion, the surgery performed, the nature of the drain used, the time of appearance of the fistula, the character of the treatment of the fistula, the time the treatment was instituted and the ultimate result. To these cases he adds two of his own. As duodenal fistula has a mortality of 50 per cent and death may supervene within two days after its development, the most essential surgical treatment should be instituted immediately. A patient with a duodenal fistula be-

comes debilitated extremely rapidly from inanition, dehydration, and loss of chloride.

One of the most important contributory factors in the formation of a duodenal fistula is gauze packing. Gauze packs increase the oedema usually present in the sutured bowel by interfering with the circulation. Slight adhesions may form between the sutures and the gauze. Removal of the gauze causes traction on the sutures which leads to enlargement of one or more suture openings. A small opening becomes rapidly enlarged by the tryptic action of the pancreatic juice and may soon develop into a fistula. In the cases reviewed, surgical treatment had a mortality of 50 per cent and conservative treatment a mortality of 27.7 per cent.

Effective therapy was first begun in 1923 by Cameron, who used continuous suction. In 1927 Potter improved the conservative treatment by acidifying the discharge with N/10 hydrochloric acid introduced deep into the fistula in a hydrochloric stream and packing the wound with gauze soaked in a mixture of olive oil and beef extract. This treatment inactivated the trypsin of the pancreatic secretion and supplied a buffer solution on which the bile could act without attacking living tissue. In addition the necessary fluids and dextrose were abundantly supplied.

In the two cases treated successfully by Kittelson, Potter's routine was followed except that the buffer was supplied by whole lactone milk.

SAMUEL J. POORELSON M.D.

Crohn B. B. and Gerendasy J.: Traumatic Ulcer of the Duodenum and Stomach. *J. Am. Med. Ass.* 1933 c, 1653

The possible rôle of acute abdominal trauma in the causation of peptic ulcer is discussed on the basis of a review of the literature and the case of a woman forty five years of age who, without any previous digestive disturbances, developed a typical duodenal ulcer following violent abdominal trauma. The diagnosis in the case reported was based on the classical subjective symptoms, the findings of roentgenographic studies, and the occurrence of hæmatemesis and melena. The possibility that the ulcer may have existed without symptoms prior to the injury is considered but is eliminated because the patient was found normally sensitive or even hypersensitive to pain by the styloid pressure test of Libman.

A gastro-intestinal ulcer may be regarded as a traumatic lesion only if there is proof of the absolute absence of gastro-intestinal complaints or symptoms prior to the injury, the trauma was severe and localized to the abdominal wall preferably the epigastrium, the onset of symptoms followed the injury immediately and the symptoms and signs assumed the characteristics of those of a true gastric or duodenal ulcer.

Traumatic ulcer is of medicolegal importance. In compensation cases much depends on the evidence of expert witnesses and authorities. Therefore

of the appendix by fluoroscopy and roentgenography with the patient in different positions. The most important part of the method is the administration of several meals of opaque material usually not more than three on two successive days. With the use of this method Buisson was able to visualize 60 per cent of normal appendices after a single meal and 100 per cent after two meals, and 30 per cent of pathological appendices after one meal, 70 per cent after two meals, and 80 per cent after three meals.

Such a reliable method of diagnosis should be of great value in the differential diagnosis of appendicitis and allied conditions and in demonstrating the simultaneous presence of a pathological lesion of the appendix with other conditions such as gall bladder disease, peptic ulcer and irritable bowel. The principal objections to it center about (1) the possible existence of a physiological condition which temporarily makes the lumen of the appendix impervious, and (2) the cost of the procedure.

Buisson discusses also the importance of local tenderness over the site of the appendix. He is inclined to ascribe less importance to such tenderness than to visualization. He regards failure of the appendix to fill as the surest single sign of a pathological lesion.

A. LOUIS ROW, M.D.

Borchardt, M. The Differential Diagnosis of Acute Appendicitis. (*Zur Differentialdiagnose der akuten Appendicitis*) *Med. Klin.* 93: II 90 1930, 70 734 770

Although appendicitis is probably the most common of all diseases and its clinical manifestations in definite cases are quite typical, the number of wrong diagnoses remains surprisingly large. In a study of the clinical material in the Zurich Surgical Clinic during the years 1921 and 1928 Clairmont found that no fewer than 30 per cent of the diagnoses of acute appendicitis sent in by general practitioners were incorrect. Although this percentage was considerably decreased in the clinic, operation showed the diagnosis to be incorrect in 6 per cent of the cases. Pathologists report 10 per cent of the extirpated appendices which they examine as being normal. In his latest monograph Aschoff estimates the incidence of erroneous diagnoses as 18 per cent.

The clinical picture of acute appendicitis, although characteristic, is changeable. Ambulatory cases, mild attacks, and abortive forms of the condition remain all too often entirely unrecognized. Therefore medical help is not resorted to at all or the manifestations are so transient that the physician sees the case when the characteristic signs can no longer be recognized. In some of these cases the lesion heals completely while in others it takes the form of latent appendicitis. This explains the fact that the apparently first clinically recognized attack which leads to operation is almost never the first attack.

Severe forms of appendicitis may also lead to error in diagnosis as the symptoms of peritoneal irritation which dominate the clinical picture are

prominent also in many other abdominal diseases and acute pleuropulmonary diseases may produce reflexly very severe symptoms of abdominal irritation exactly like those of acute appendicitis.

However the most important factor which may excuse and explain the frequent errors is the necessity for rapid diagnosis, the success of surgery for appendicitis being dependent chiefly upon early operation. As delay must be avoided, it is best to remove a clinically suspicious appendix even when it shows no evidence of disease at operation and the pathologist finds it normal.

The author names the various conditions which in his experience have been mistaken for appendicitis in spite of the most careful observation. Among these is typhilitis which may occur as a primary disease or represent the residuum of a generalized colitis. In this condition the symptoms of peritoneal irritation as well as the tenderness to pressure may be circumscribed, but as a rule are not so sharply localized to a small area as in true acute appendicitis.

Another condition mentioned is typhlocolitis which, in the opinion of many experienced physicians, may lead to appendicitis. Typical of this disease is primary diarrhea, for which the administration of castor oil has been recommended. The author rejects this treatment. For cases in which the diagnosis is doubtful he recommends immediate surgery based entirely on the local tenderness, rigidity and the pulse curve.

Even for cases presenting the clinical symptoms of so-called acute pseudo-appendicitis, among which are included all symptoms of peritoneal irritation, the author regards operation as advisable when signs of irritation do not perceptibly subside during the first twelve to eighteen hours.

Symptoms of peritoneal irritation may occur particularly in children during or after acute sore throat. Also in this condition there may be a true or pseudo-appendicitis with all the difficulties of differential diagnosis. The time for operation depends upon the persistence or rapid disappearance of the typical symptoms of peritoneal irritation during the first twelve to eighteen hours after the beginning of the attack.

The author is unable to confirm the frequency of true acute appendicitis during the course of grippe and grippé epidemics which has been reported by many surgeons. In his opinion most of these cases are pleuropulmonary forms of grippé with symptoms of peritoneal irritation. The same clinical picture may occasionally be found in pneumonia, pleurisy and the so-called intestinal forms of influenza. In these conditions also the surgeon must observe whether the symptoms of irritation subside within the allotted interval. Occasionally true appendicitis occurs during the course of influenza and pleuropulmonary disease.

Dysentery and diphtheria often produce the picture of pseudo-appendicitis, and of course true appendicitis may occur in association with them. The theory of Hilgermann and Pohl that diphtheria

bacilli alone may produce a true acute appendicitis has not been definitely proved.

With regard to involvement of the appendix in typhoid fever there is a wealth of literature. In 1923 Madelung wrote an exhaustive monograph on the subject. The author believes that it is at least doubtful whether true appendicitis can be produced by typhoid bacilli alone.

The symptoms of paratyphoid and dysentery are similar to those of appendicitis. The author reports a case of true appendicitis with dysentery in a five year-old boy which was difficult to diagnose but was cured by operation. The appendix in this case was not involved by the dysenteric process, as a pathologic-anatomical study revealed in the tip of the appendix severe necrotizing, phlegmonous inflammation with no demonstrable relationship to the dysentery.

Because of the frequency with which it is confused with appendicitis, particular attention should be paid to the clinical picture of cyclic vomiting with acetonaemia which occurs chiefly in neuropathic children between three and twelve years of age. This clinical picture is little known. The vomiting the poor general condition with usually a high fever and the retracted scaphoid abdomen may be mistaken for manifestations of appendicitis. Medical treatment by the administration of glucose the injection of 10 units of insulin and the administration of camphor and caffeine may save life whereas surgical removal of the always normal appendix inflicts serious trauma.

Particularly difficult to differentiate from appendicitis are the so-called umbilical colics of small children. The author cannot accept the view that these colics are due merely to a neurogenic functional disturbance. He warns against delay in operating as pain localised about the umbilicus is often the only evidence of appendiceal disease.

In persons with intestinal oxyuriasis and other parasitic infections of the intestines the picture of appendicopathy *halmintia* (Aschoff) occasionally appears. Contrary to the view of Rheindorf this is not a true appendicitis but rather an irritative condition for which operation is indicated.

In Henoch's abdominal purpura the question of appendicitis does not usually arise. The irritation and small hemorrhages by which the viscera particularly the intestinal walls are involved may occur also in the appendix but usually do not justify appendectomy.

Great difficulties in differential diagnosis may be presented by tuberculosis of the peritoneum and the intra-abdominal organs. The symptoms are often so alarming that exploratory laparotomy is indicated.

The author discusses also the clinical manifestations of omental torsion inflammation of the omentum omental tumor torsion of appendices epiploica diverticula of the large intestine Meckel's diverticulum and cysts of the urachus and calls attention to the difficulty and even the occasional

impossibility of differentiating these conditions from acute appendicitis without operation. In addition he discusses in detail acute attacks in renal and ureteral lithiasis acute right-sided pyelitis, pyonephritis abscesses floating kidney and acute cholecystitis. These conditions are very frequently mistaken for acute appendicitis, but if the patient is examined carefully the error is usually avoidable.

In conclusion Borchardt discusses the acute diseases of the female genitalia, which are among the most frequent causes of error in the diagnosis of appendicitis. These include acute inflammation of the adnexa, ectopic pregnancy twisted ovarian tumors ruptured ovarian cysts twisted tubes and hematosalpinx. Only skillful palpation and the use of all other methods of examination can prevent errors of diagnosis in these conditions. Of particular interest is the reference to the frequency of acute appendicitis during pregnancy. The mortality of unrecognized appendicitis in pregnancy is still between 35 and 60 per cent.

SCIENCE (Z)

Nario C V : Surgical Treatment of Certain Lesions of the Sigmoid Colon (Terapéutica quirúrgica de algunas lesiones del asa sigmoide). *Arch. uru. graves de med. ciruj. y especial.* 1933 11, 319

Cancer of the sigmoid is a scirrhous tumor which is small and obstructive and metastasizes to the regional lymphatics rather late. Its development passes through three clinical stages the first characterized by dyspepsia, the second by chronic obstruction and the third by acute obstruction. The condition is rarely diagnosed in the incipient stage or first period. The diagnosis may still be regarded as early when the second period of development has been reached. Even in this stage there is sometimes a palpable tumor with localized peritonitis. In the third period the clinical picture is that of an acute surgical condition of the abdomen.

Surgical therapy varies according to the location of the cancer. When the tumor is high up in the freely movable loop of sigmoid a left pararectus curved incision is made which can be subsequently enlarged either above or below as required. The growth is then mobilized by manual separation of adhesions if possible. For external delivery of the involved loop section of the mesentery may be necessary. Following extirpation the wound is sutured around the delivered loop. The loop may be extirpated at once or if obstruction is not complete at a later period. At a still later date the ends may be sutured outside of the peritoneal cavity.

When the growth is lower down in the recto-sigmoid the procedure followed is essentially that devised by Lockhart Mummery. After exploration of the affected loop of sigmoid the arteries are ligated and sectioned. A racquet incision of the pelvic peritoneum is then made and the underlying cellular tissue and lymphatics are dissected free. The superior hemorrhoidal artery is ligated and the pararectal space dissected free. The bowel is then

clamped below the tumor cut and delivered externally. The rectal segment is closed and covered over again by peritoneum of the pelvic floor. The abdominal incision is closed around the delivered loop of sigmoid and the loop is later extirpated so that a permanent colostomy remains.

In megacolon, surgery may be indicated for acute volvulus or simple sigmoidal megacolon with stasis and retention. In acute volvulus the abdomen is explored through a left rectus incision and the volvulus untwisted. If the parts are viable sigmoidopexy is performed. When the entire loop is to be removed it is mobilized by section of the mesocolon and the entire loop is exteriorized. Later the bowel segment is excised, and still later the continuity of the lumen of the bowel is restored by extraperitoneal closure. WILLIAM R. MEYER, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Halperin, G.: Regenerative Capacity of the Extrahepatic Biliary Tracts: A Clinical and an Experimental Study. *Surg. Gynec. & Obst.* 93:3, 171, 863.

The many possible lesions of the extrahepatic bile ducts and the numerous surgical procedures attempted for their correction are reviewed. The use of a rubber tube to bridge a defect in the common bile duct is discussed in detail, particularly with relation to the ingrowth of an epithelial lining for the artificial tube. Many surgeons report having found regeneration of the biliary epithelium within the tract formed by omentum, adhesions, and adjacent viscera when the rubber tube was passed, but others have consistently found only a connective tissue lining. Adhesions invariably cause marked shortening of the tube.

The author operated upon 135 dogs and completed 18 successful experiments in which a rubber tube was used to replace a defect in the common duct. The termination of the tube was of 3 types. In some of the experiments the distal end of the tube was inserted through the ampulla of Vater. In others it was buried in the duodenum as in the Witzel technique. In a third group it was secured in the common duct 1 cm. or more from the ampulla. In each instance omentum was wrapped about the intervening rubber tube.

An ascending infection developed in the majority of the dogs and was always present when a stenosis occurred in the regenerated duct. Epithelial regeneration occurred readily when only longitudinal slits were made in the common duct. When the new channel was artificial in its entire circumference, epithelium did not grow into it, but when only 50 per cent of the circumference of the new duct was artificial, epithelial regeneration was complete in the majority of the experiments. It is obvious from the results that the blood supply determined the success or failure of the epithelial ingrowth.

STARLEY H. MEYER, M.D.

Pérez, E. M.: Experimental Obstruction of the Common Bile Duct (La obstrucción experimental del coledoco). *Rev. méd. quirúrg. de Méjico, semi. ano* 1933 1: 431.

From the investigations reported in this article the author draws the following conclusions:

1. Experimental ligation of the common duct in the dog always produces the icteric syndrome regardless of the conditions under which it is done.

2. The icterus is independent of infection, its intensity varying only with the renal threshold of elimination of bilirubin, the biligenic capacity of the liver and the degree of compensation by the extrahepatic biliary ducts.

3. Clinical icterus has no relation to the curve of bilirubinemia.

4. The compensatory rôle played by the extrahepatic biliary ducts is related to the dilatations of these ducts immediately following the operation and the absorption occurring subsequently.

5. Icterus caused by aseptic ligation of the common duct is due to (a) simple biliary reflux, and (b) secondary hepatosis.

6. The typical hepatic lesion in experimental occlusion of the principal bile duct is parportal hepatosis (fatty degeneration).

7. The degenerative hepatic lesion is due to (a) the action of the bile on the cells, (b) the action of the bile on the neurovascular system which produces changes in the portal circulation resulting in cellular changes.

8. In the dog, biliary cirrhosis as the final stage of biliary stasis was not demonstrated, only parenchymatous atrophy being apparent.

WILLIAM R. MEYER, M.D.

Pauchet, V., and Hirschberg, A.: Some Observations on the Surgery of the Bile Passages—Drainage and Cholecystostomy. *Operative Technique, Discussion and Deductions* (À propos de quelques observations de chirurgie des voies biliaires artificielles. Drainage et cholecystostomy. Technique opératoire. Discussion et deductions). *Rev. de chir.* Par. 933, 11, 75.

The problem of calculous or catarrhal cholecystitis is still unsolved in many of its phases. Therefore the therapy remains a subject for discussion. As the frequency of associated lesions is extremely high, operation should always include a thorough exploration of the adjacent viscera.

Among the lesions which may complicate cholecystitis, colitis is frequent. Often there are pericolic adhesions. Frequent also are duodenal and pyloric adhesions and gastric ulcer. Of much less importance is appendicitis. In cases of cholecystitis based on hemolytic jaundice splenomegaly occurs.

Among the gastric symptoms, hyperacidity is more common than hypo-acidity. Anacidity in the resting stomach often coincides with hyperacidity after a test meal. Hyperstalsia is rare. Atrophagia is often directly related to gall bladder disease and may be cured by cholecystectomy.

When serious lesions are associated with gall bladder disease the treatment is particularly difficult.

The anesthesia of choice for gall bladder surgery is high spinal anesthesia. When the proper technique and dosage are used (discussed by the author in detail) no untoward effects are observed or at most there is slight nausea. For simple cholecystectomy local infiltration anesthesia is sufficient.

In the treatment of cholecystitis even of the calculous form drainage has recently been gaining ground. Drainage is especially valuable in cholangitis and pancreatitis. However when the gall bladder is definitely altered, cholecystectomy is preferable unless there are complicating lesions.

When cholecystitis is found at operation as a complication of more important lesions of the appendix, colon or stomach the gall bladder should be left undisturbed and the chief lesion treated. The author cites a case in which gastro-enterostomy was performed for pyloric obstruction of biliary origin and the calculous gall bladder the original source of the trouble was not removed until three years later. The surgeon is always tempted to do a combined operation but the dangers are very great because of the usual decrease of the functional capacity of the liver.

The results of drainage are generally good, the favorable effects becoming manifest after from ten to fifteen days. However certain difficulties may be encountered. A calculus which has been overlooked may arrest the flow of bile. Occasionally the gall bladder becomes fibrotic and cholangitis develops. When there is an associated pancreatitis, the symptoms re-appear with closure of the fistula. Under such circumstances a new element has been added by the operation, namely infection. If the cholangitis is severe, the surgeon must re-operate promptly and re-establish drainage with a Kehr or Duval tube.

Cholecystectomy gives almost constantly good results, especially when stones are present. Re-appearance of the symptoms after a period of relief is most grave. Post-prandial diarrhoea, anorexia, loss of weight and biliary colic indicate the presence of pancreatitis.

Twelve cases are reported in detail to illustrate some of the difficulties encountered in gall bladder surgery.

The techniques of drainage through the ampulla of Vater and of choledochoduodenostomy are shown by drawings. ALBERT F DEGROAT M.D.

Amorosi O: Changes in the Viscera Following Total Deviation of the Bile from the Intestine (Le alterazioni degli organi consecutive alla deviazione totale della bile dall'intestino) *Ann Ital di chir.*, 1933 xli, 1

The author established a complete biliary fistula in dogs kept the animals under observation for a period of five months, and at the end of that time killed them and studied their organs histologically.

More or less well marked changes (shown by photomicrographs) were found in the liver, spleen kidneys suprarenals, thyroid and parathyroid glands bones, lymph nodes, pancreas, stomach, duodenum and blood. Amorosi believes that these changes may have been due to a toxemia or to a change in pigment or calcium metabolism secondary to lack of bile in the body. EUGENE T LEEDY M.D.

Huard P and Montagné M: Studies on the Technique of Splenectomy for Splenomegaly (Recherches sur la technique de la splénectomie pour splénomégale) *J de chir* 1933 xli 698

The spleen being a relatively inaccessible organ especially when it is enlarged or adherent, a large number of methods of approaching it have been devised. The various routes adopted may be classified as the abdominal, the thoracic and the abdominothoracic.

The abdominal approach often requires excessively mutilating incisions. Important vessels and nerves must be cut and to obtain exposure, resection of the costal cartilages may be necessary.

The phrenicothoraco-abdominal route (Auvry 1899, Schaefer 1902) gives thorough exposure of the splenic fossa, but involves a pneumothorax that many patients with splenomegaly are unable to tolerate. To avoid this inconvenience the authors have devised an operation in which advantage is taken of the infrapleural space which exists between the lower border of the pleura and the diaphragm at the level of the eleventh rib about 5 cm medial to the free extremity of the rib. The problem of obtaining sufficient exposure is solved by two circumstances: (1) the pleural cul-de-sac is frequently obliterated at this level in splenomegaly and (2) the cul-de-sac is of sufficient depth that, being only a potential cavity it may be opened without creating a pneumothorax. The eleventh rib is therefore resected and the incision carried through its bed and through the diaphragm. The thoracic incision is carried downward and forward through the abdominal wall a variable distance depending upon the size of the spleen. With the use of this incision the surgeon has the choice of bringing the spleen out of the abdominal cavity or of immediately ligating the pedicle. To reduce the size of the organ and save blood, epinephrin may be injected directly or into the splenic artery.

The authors describe in detail the variations of the operation which may be employed to meet special conditions. The article has sixteen illustrations. ALBERT F DEGROAT M.D.

Lucchese G: Sympathectomy of the Splenic Artery (La simpatectomia dell'arteria splenica) *Arch Ital di chir* 1933 xxxiii 585

Lucchese reviews the scanty literature on changes following sympathectomy of the splenic artery and reports experiments which he carried out on rabbits. In the latter he destroyed the sympathetic plexus by painting the circumference of the artery with

6 per cent phenol. Two of the eight rabbits died. The others remained in good condition and were killed from thirty to forty days after the operation. Normal rabbits were used as controls. The results are shown by tables and graphs and are summarized as follows:

The resistance of the red corpuscles was diminished as regards its maximal limit but especially as regards its minimal limit. The coagulation time was markedly decreased. The platelets were increased beyond the usual rise after any operative intervention. The curve reached its peak during the first week and remained high for a month. Van den Bergh's reaction for bilirubin in the serum was negative. The red count and the total and differential white counts were unaffected. Before the operation adrenalin constantly produced a lymphocytosis, whereas after the operation it caused a neutrophilic leucocytosis. Microscopic examination showed the veins of the splenic pulp to be greatly congested. The cellular composition of the pulp the lymphoid corpuscles and the trabeculae did not differ essentially from the normal.

In conclusion Lucchese says that destruction of the periaarterial sympathetic plexus modifies some of the phenomena generally attributed to the spleen. However the theory of a mere augmentation of function due to hyperemia is not sufficient to explain the changes as the congestion is produced by destruction of the neurovegetative system. An increase in the blood supply may be combined with marked atrophy of the parenchyma such as occurs after sympathectomy on the male genital organs. The spleen lends itself poorly to the investigation of this problem. The disappearance of adrenalin lymphocytosis after sympathectomy is perhaps related to inhibition of splenic contraction, as the latter may be the method of action of the sympathetic system on the spleen. The return of the various phenomena to their original state about a month after sympathectomy may be due either to re-establishment of the functions of the splenic plexus or to vicarious action of the general lymphopoeietic system.

The article has an extensive bibliography.

MARY ELIZABETH MORSE, M.D.

GYNECOLOGY

UTERUS

Magnani L.: Clinical Observations on Torsion of Fibromyomata of the Uterus (*Osservazioni cliniche sulla torsione nei fibromiomi uterini*) *Riv Ital di ginec* 1933 xlv 493

Axial torsion of the fibromatous uterus and torsion of pedunculated subserous fibroids have received considerable attention, but most of the discussions are based on a single case or a limited number of cases.

Most authorities agree that such torsions are relatively rare. However the number of cases reported has gradually increased. In 1899 Ferri collected 20 cases of torsion of the pedicle of subserous pedunculated fibroids and in 1930 Dallera was able to collect 70. In 1914 Cova estimated the number of recorded cases of torsion of the fibromatous uterus on its axis at about 100 but in 1926 Hiltanides was able to collect only 86. In 1930 Petridis added 16.

According to Piquand and Lemeland torsion occurs in about 1 of every 400 cases of fibromatous uterus but in the author's series of cases it occurred in about 2 of every 100 cases an incidence which corresponds to that given by most statistics (Collingworth).

Magnani reports 22 cases in which the clinical diagnosis was verified at operation. In 5 there was torsion of a pedunculated fibroid in 15 torsion of a fibromatous uterus and in 2, a combination of both.

The symptoms are dependent upon the character of the onset (acute subacute or insidious). Pain fever visceral disturbances and metrorrhagia are practically constant.

Torsion of pedunculated fibroids is most common at about the age of forty years because of the increased frequency of fibroids at that age. The size of the tumor has some influence and the location of the tumor is of great importance. In the author's cases the tumors were situated most frequently in the tubo-uterine angles. Of 22 cases of torsion of pedunculated fibroids reported by Piquand, the neoplasm arose from the middle of the fundus in 12 from the anterior wall of the uterus in 4 from the posterior wall in 4 and from the angles in only 2. The structure of the tumor particularly eccentric cavities filled with fluid or pus and eccentric calcification may be a factor in torsion. Other factors are the length and thickness of the pedicle. Changes in the position of the gravid uterus also exert an influence. Of the author's 7 cases of torsion of pedunculated fibroids alone or associated with torsion of the uterus 6 were those of multiparæ whereas of his 15 cases of torsion of the fibromatous uterus 13 were those of nulliparæ.

Torsion of the fibromatous uterus is favored by injuries to the abdomen brisk movements of the uterus sudden violent peristalsis and subserous pedunculated fibroids.

The mechanism of the torsion is rather obscure. While many theories have been advanced to explain it, none of them applies to all cases.

Torsion of the uterus seldom exceeds 90 degrees but 2 or more complete turns have been reported. The most pronounced torsion in the author's cases (180 degrees) occurred in the pedicle of a subserous pedunculated fibroid.

The associated pathological changes were adhesions which were present in practically all cases and predominantly omental and ascites which was present in only 2 cases.

The diagnosis of torsion is difficult especially when the condition has an insidious onset.

Cases of supposed torsion of a fibromatous uterus or of pedunculated fibroids in which such torsion was not found at operation cause the author to conclude that detorsion occurs as readily as torsion.

The author believes that the operative mortality at the present time is certainly below the 8 per cent reported by Piquand and Lemeland in 1909. According to Piquand and Lemeland, the mortality in acute cases not operated upon is 63 per cent.

Operation should be done as soon as possible after the crisis. The operative procedures vary from conservative measures to hysterectomy.

The most frequent complication is thrombophlebitis.

All of the author's cases were treated surgically with good results. GEORGE C. FINOLA, M.D.

Petit Dutailh, P.: A Comparison of Different Methods of Using Radium-Surgery in Epithelioma of the Cervix Uteri With Other Methods of Treating Such Cancer (*Confrontation de diverses méthodes de radium-chirurgie de l'épithéliome du col avec d'autres modes de traitement de ce cancer*) *Gynécologie* 1933 xxxii 5

Statistics from various clinics show that the primary mortality of present-day radium therapy of cervical cancer is 3.3 per cent. Death is due almost invariably to infection, and the way in which the radium is applied is undoubtedly an important factor in the development and severity of inflammatory processes (cellulitis salpingitis phlebitis peritonitis and septicæmia).

The author recommends the following methods of treatment:

1. Extravaginal radium therapy after curettage and cauterization. This is recommended for patients in Groups 2, 3, and 4. Curettage should be followed by cauterization with heat. This seems to safeguard

the patient against hemorrhage and infection. The curette removes the bulk of the involved tissue and the cautery completes the destruction seals off vessels, and prevents dissemination of cancer cells through channels opened by the curette. The uterovaginal application of radium must be such that it delivers a dose to all affected areas without causing burns of vital structures which may lead to fistulae of the rectum or bladder. During and following the use of radium vaginal and uterine irrigations with weak antiseptics should be employed to reduce local infection. In three or four months scar formation and healing will be complete.

2. Uterovaginal radium therapy following curettage and cauterization and supplemented by radium therapy over the buttocks. This is applicable to cases of Group 4 with fistula. The technique includes curettage, cauterization, and the placing of radium as in the first method. In addition, bilateral perineal incisions are made and radium is introduced near the internal obturator muscle, between the muscle and the aponeurosis in the ischio-anal fossa. The object of this procedure is to suppress metastases by treating important lymphatic chains more directly than is done in most methods.

3. Uterovaginal radium therapy after amputation of the cervix. This treatment is indicated in cases of Group 1. Many surgeons irradiate these early cases first and perform an abdominal complete hysterectomy six weeks later. After hysterectomy radium irradiation is hopeless as the radium cannot be inserted effectively and the peritoneum is close to the field where it must be applied. The author amputates the cervix and then applies radium either immediately or after healing of the surgical wound. This procedure has resulted in a cure in every case of Group 1 in which it has been used.

In cases of cancer of the cervix treated by radical abdominal operation the mortality ranges from 5 to 10 per cent. In 51 cases which the author treated by his various methods of surgical preparation for radium therapy there was only 1 death a mortality of 1.9 per cent.

Of his cases in Groups 2, 3 and 4, the author obtained a cure in 24 per cent, whereas Regaud's statistics for a similar group showed the incidence of cure to be 28 per cent. On the other hand of his cases in Group 4, the author obtained a cure in 20 per cent whereas Regaud obtained a cure in only 5 per cent of similar cases.

Of his cases of Group 1 the author obtained a cure in 100 per cent and Regaud a cure in only 71.5 per cent. Monod reported a cure in 56 per cent of ninety-seven cases in Groups 1 and 2. Hartman obtained a cure in 83 per cent of cases in which radium therapy was followed by hysterectomy and Faure obtained a cure in 66 per cent of cases similarly treated.

The author draws the following conclusions:

1. The Wertheim operation is far from ideal.
2. The problem of treating cancer of the cervix today is not the choice between radium irradiation

and operation, but the choice between radium irradiation alone and combined with surgery.

3. Radium therapy has a lower mortality than radical surgery and surgery combined with radium irradiation seems to have still further decreased the mortality.

GEORGE C. FROGA, M.D.

GEORGE H. GARDNER, M.D.

ADRENAL AND PERIUTERINE CONDITIONS

Taylor J M, Woffermann S J., and Krock, F.: Arrhenoblastoma of the Ovary. *Surg. Gynec. & Obst.* 93, 171, 1940.

The case of arrhenoblastoma of the ovary reported in this article is the first reported from the United States and the twenty-seventh to be recorded in the literature. It shows the powerful influence exerted by sex hormones on the development of the secondary sex characteristics. Arrhenoblastoma of the ovary are most common between the ages of twenty-one and thirty-five years.

The signs of such tumors include defeminization, masculinization, pain and blood changes. The earliest signs are usually amenorrhea and sterility. The breasts atrophy, the genitalia, with the exception of the clitoris, become hypoplastic, the vaginal canal becomes short and contracted, and the body of the uterus and the cervix become atrophic. There is an excessive growth of hair on the body. A beard appears and the pubic hair is of the male type. The facial expression is masculine because of coarseness of the features and bushiness of the eyebrows. The voice is low pitched. In long-standing cases the clitoris is hypertrophied. Pain is usually caused by pressure of the rapidly growing tumor. Anemia and fever are usually present. The Aschheim-Zondek test is negative. After removal of the tumor the normal female characteristics are restored.

The treatment indicated is removal of the tumor. Only one ovary is affected.

Meyer distinguishes the following three histological types of arrhenoblastoma:

1. Adenoma testiculare. This structure is very similar to the tumor of the same name occurring in the testis and is predominately tubular. It causes masculinization only exceptionally.

2. Atypical tumors. These cause marked masculinization. The structure of the tumors is sarcoma like and the tubules are often rudimentary.

3. Intermediate group. These are a mixture of Groups 1 and 2. They arise from undifferentiated germ cells in the hilum of the ovary. They are malignant but usually do not metastasize before six or seven years.

T. FLOYD BELL, M.D.

EXTERNAL GENITALIA

Fagioli, M.: Solid Tumors of the Glands of Bartholin (Tumori solidi della ghiandola di Bartolino). *Riv. Ital. di ginec.* 913, IV 80.

Benign neoplasms of the glands of Bartholin are the rarest of all benign neoplasms of the vulva.

On the basis of their structure they have been classified as fibromata, lipomata, fibromyxomata and fibromyomata.

Fibromata may arise from many diverse points. They develop most frequently from the labia majora and less frequently from the labia minora, clitoris, hymen, urethral orifice, posterior vulvar commissure, frenulum, round ligament, and glands of Bartholin.

In the chapter on diseases of the vulva in Stoeckel's recent treatise, Kehrer cited only four cases of solid tumors of the glands of Bartholin. De Gironcoli collected seventy three cases of benign tumors of the vulva from the literature and reported two others. His collection included three tumors arising from the labia minora and seventy two arising from the labia majora but none arising from the glands of Bartholin.

In 1932 Garofalo reported a tumor originating from the connective tissue of the labia majora and a tumor arising from an implant.

The author reviews the various theories regarding the pathogenesis. According to von Recklinghausen, these tumors arise from the connective tissue of cutaneous nerves. Huertle and Nauwerk distinguish between those arising from the blood vessel sheaths and those having their origin in the sweat glands. De Gironcoli is uncertain of their origin. By some the neoplasms are believed to have their beginning in the smooth muscle, round ligaments or interstitial tissue of the glands of Bartholin. Luque questions whether solid tumors occur in the glands of Bartholin.

In the study of the works of Velt, Klob, Scanzoni, Vail, Crossen, Graves, Meyers and others the author found that up to the present time no one has attributed the genesis of fibromata of the labia majora to the glands of Bartholin.

The case reported by Fagnoli was that of a woman thirty-one years of age who had had two children. Menstruation began at the age of fourteen years and had always been regular. The menstrual flow was moderate. There was no history of leucorrhoea. General physical examination and urinalysis were entirely negative. The vulva were found displaced toward the left by a tumor mass the size of a nut which arose from the right side of the introitus. No maculae of Saenger were noted, and there was no leucorrhoea. On palpation of the labia a hard, smooth, painless, mobile tumor mass the size of a large nut was found at the right posterolateral margin of the vaginal orifice. The orifices of both Bartholin glands were distinctly visible. Smears showed a few gram negative bacilli and many chains of streptococci. A diagnosis of cyst of Bartholin gland was made. After its excision, the tumor was found to be solid.

On histological examination of the specimen no trace of glandular tissue could be discovered. Serial sections showed the entire tumor to be composed of a compact tissue of uniform fibrillar structure with fusiform cells presenting elongated nuclei. All

of the tissue was discretely vascularized by a series of blood vessels irregularly distributed in the parenchyma. There were no areas of regression or necrosis. The histological diagnosis was fibroma.

As there was no evidence of an inflammatory reaction, the author concludes it unnecessary to distinguish this benign tumor from the products of a chronic inflammatory process. While Kehrer's demonstration of smooth muscle fibers in these fibromata suggests a round ligament origin, Fagnoli calls attention to the fact that the glands of Bartholin also contain smooth muscle as well as striated muscle.

GEORGE C. FINOLA M.D.

MISCELLANEOUS

Witherspoon J. T. The Interrelationship Between Ovarian Follicle Cysts, Hyperplasia of the Endometrium and Fibromyxomata; A Possible Etiology of Uterine Fibroids. *Surg Gynec & Obst* 1933 161, 1046.

The author reviews the formerly accepted theories as to the origin of uterine fibroids and discusses the histogenesis of the tumors and the influence of heredity, sterility and race in their development. He cites in particular Sampson's theory that local hyperplasia of uterine muscle cells is caused by the stimulus of menstrual blood which has acquired access to the myometrium by retrograde flow through the venous sinuses of the endometrium. The observation made by Polak and Lynch that fibroids are frequently associated with glandular disturbances is discussed. Ovarian activity has generally been considered a factor in the development of fibroids because these tumors occur most frequently in the years of greatest ovarian function. The cause and effect relationship of follicle cysts of the ovary and hyperplasia of the endometrium is discussed on the basis of observations made by Schroeder and Meyer. That hyperplasia of the endometrium is caused by excess oöstrin stimulation from the multiple follicle cysts of the ovary is indicated by the following facts:

1. It is observed only during the years of greatest functional activity.
2. It occurs at the two extremes of menstrual life when the ovarian cycle tends not to follow its normal rhythm because it is just beginning or ending.
3. There is no evidence of an inflammatory origin as it occurs in very young girls.
4. The bleeding resulting from it is checked by removal of the ovaries and by destruction of ovarian function by X-ray irradiation.
5. Curettage gives only temporary relief a fact suggesting that it does not reach the cause.
6. Follicle cysts are found constantly and the blood contains an excess of follicle hormone at such periods.
7. Oöstrin has been proved experimentally to be a growth hormone to endometrial glands and stroma and hyperplasia of the endometrium presents similar histological characteristics.

8. Hyperplasia of the endometrium is found after the menopause in association with granulosa-cell tumors which give rise to excess oestrin or hyperoestrinism in the blood.

9. The absence of corpora lutea precludes the formation of progesterin.

10. The lack of progesterin, the corpus luteum hormone is confirmed by the absence of endometrial secretory changes normally produced by this hormone.

Since the uterus as a whole is involved in the productive process, it seems logical to conclude that the action of oestrin is not limited solely to the endometrium but affects also myometrium especially if there is pathological stimulation of this tissue at the same time that the endometrium is being abnormally stimulated to undergo hyperplasia. Since the rate of growth of fibromyomata is not exceedingly rapid except in pregnancy and malignancy and possibly in youth it seems logical to assume that if these growths are the results of unopposed

oestrin stimulation of the myometrium their appearance would be slower than the hyperplastic endometrial changes. Hence it might be concluded that the unopposed action of oestrin on the uterus results in (1) immediate endometrial changes characterized by hyperplasia and (2) more latent myometrial disease of the nature of fibromyomatous growths, if the hormonal stimulation is prolonged sufficiently.

On the basis of this hypothesis the author made a study of 16 cases of hyperplasia of the endometrium in which the diagnosis was confirmed at operation and a second operation was performed for fibromyomata after an approximate interval of four years and four months. In addition to the findings of this study he reviews 124 cases of fibromyomata diagnosed by microscopic examination, reporting the associated ovarian and endometrial findings as preventing evidence in support of a cause-and-effect relationship between ovarian follicle cysts and hyperplasia of the endometrium and suggesting a possible factor in the development of uterine fibroids.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Lawrence J S : Concerning Death of the Fetus in Pregnancy *Am J Obst & Gynec* 1933 xiv 633

Of seven cases of stillbirth in which the fetus manifested distress during the pregnancy placentalitis was present in five and was the only abnormality in two. Of five cases of stillbirth in which there was no evidence of fetal distress during the pregnancy placentalitis was found in only one. Of four cases in which there were signs of fetal distress during the pregnancy and the child died soon after birth placentalitis was found in two and was the only pathological condition in one. Of fourteen cases in which the child died soon after birth but had not manifested distress during the pregnancy placentalitis was found in none. Of nine cases in which the child manifested distress during the pregnancy but survived after birth placentalitis was found in four and was the only abnormal finding in three. On the other hand, of six cases in which the child did not show signs of distress during the pregnancy and survived after birth, placentalitis was found in all and was the only abnormality in four. The author believes, however, that in these cases the placentalitis was less severe.

Lawrence calls attention to a type of intra uterine fetal death which is due to fetal starvation caused by difficulty in filtration of the required nutriment through a placenta with increased connective tissue and coarsening of the maternal and fetal elements. He states that carbohydrates can filter through such a placenta if they are given in sufficient amounts and in proper form. The administration of sufficient quantities of carbohydrates in the most diffusible form will temporarily relieve the fetal distress and an excessive but not exclusively carbohydrate diet will prevent recurrence of the distress. Observation of the rate and rhythm of the fetal heart and attention to the reports of instructed mothers regarding the periodicity and quality of the fetal movements will often disclose the advent of fetal distress in time for measures to prevent intra-uterine death.

EDWARD L. CORNELL, M D

Vignes, H. and Lemant, J : Changes in the Reticulo-Endothelial System During Normal and Abnormal Pregnancy (Modifications du système réticulo-endothéliale pendant la grossesse normale et pathologique) *Gynec et obst.*, 1933 xvii, 235

The authors summarize the findings of various investigators concerning the functional activities of the reticulo-endothelial elements during normal and abnormal pregnancy. These phagocytic cells present in the connective tissues certain organs, and the blood stream are easily recognized because of their

property of fixing intravenously injected acid dyes notably carmine. This property of vital staining permits a morphological study of the reticulo-endothelial system and the rate of the dye fixation gives important information concerning the functional activities of its elements.

Histological studies show an increase during pregnancy in the number of reticulo-endothelial elements in the uterus, endometrium, placental site, maternal surface of the placenta and other organs of the body. Functional studies are less uniformly conclusive. These are based on the results following the injection of carmine and India ink and on studies of the fixation of colloids normally present in the body (haemoglobin, cholesterolin). The results obtained are variable but for the most part seem to indicate a diminution of the dye fixing power during pregnancy. At the same time there is evidence to justify the supposition that because of the general increase of metabolic activity during pregnancy the activity of the reticulo-endothelial system is also increased. As other organic functions are accentuated during pregnancy to a point approaching the physiological maximum the authors conclude that this is true also of the reticulo-endothelial system. During the puerperium there is a very rapid return to the normal rate of function. Blockage or delayed fixation of acid dyes is most marked in eclampsia, hyperemesis, retroplacental hemorrhage and generalized edema, but there is no evidence to support the view that it is the cause or the result of such disorders.

The reticulo-endothelial system participates actively in the defense of the body against infection. When the laws of its reactions are better understood they will give important information regarding prognosis and treatment. HAROLD C. MACK, M D

Marchese, E : Research on the Determination of the Pelvic Inclination and the Conjugata Vera (Ricerche sulla determinazione dell'inclinazione pelvica e della conjugata vera) *Clin ostet* 1933 xxxv 193

The author describes the technique he uses for determination of the pelvic inclination and the conjugata vera and shows the instruments by illustrations. With the inclinometer of Jacobs he found that the pelvic inclination averages about 55 per cent. He gives the measurements of fifty female pelvis and calls attention to the important relationship between the inclination of the symphysis pubis and the conjugata vera. A. LOUIS ROSE, M D

Bothe F A.: Hyperthyroidism Associated with Pregnancy *Am J Obst & Gynec* 1933 xvi 618

Bothe reviews ten cases of hyperthyroidism complicating pregnancy. Eight were cases of severely

toxic goiter and two were cases of mild toxicity. The two patients with mild toxicity were treated medically with successful termination of the pregnancy. Of the eight with severe toxicity two refused operation—one miscarried in the hospital before surgery could be performed, and five were subjected to subtotal thyroidectomy. Three of the latter were operated upon before the fifth month of pregnancy and two in the sixth month. In all of the five cases in which operation was done the pregnancy ended successfully at term.

In the cases of five patients with a normal delivery at term the symptoms of hyperthyroidism persisted after delivery. Due time having been allowed for re-adjustment of glandular function, operation was advised during the second or third months following delivery in four cases. Two of the patients refused operation and have not been traced. Two of those who were operated upon recovered and have had no recurrence. One of those operated upon died.

In mildly toxic cases medical treatment is instituted first. The patient is placed at rest in bed, treated with sedatives, given 10 drops of Lugol's solution three times a day and isolated from external stimuli which might disturb her emotional stability. If improvement or complete relief of symptoms is maintained, medical care is continued during the pregnancy.

In cases of severe toxicity the treatment should be directed to the thyroid. After pre-operative preparation a subtotal thyroidectomy should be done. This treatment is indicated particularly if the patient is seen in the first five months of pregnancy.

EDWARD L. CORWELL, M.D.

Hofbauer J: Epithelial Proliferation in the Cervix Uteri During Pregnancy and Its Clinical Implications. *Am J Obst. & Gynec.* 1933 xiv 779.

Routine examination of twenty nine gravid uteri revealed a remarkable difference in the degree of the epithelial changes. Various evidences of epithelial activity such as reduplication of cell layers, vacuole formation, and vesicular polymorphism of the nuclei, were found in certain areas of every specimen. In eight of the twenty-nine specimens, however there was very characteristic activity. In this group the principal epithelial variations observed were epithelial proliferation with stratification, the occurrence of mitotic figures in the proliferating epithelium, considerable epithelial down growth into the connective tissue, indirect metaplasia and goblet-cell formation.

The morphological appearance of the hyperplastic changes of the cervical epithelium found in a small but notable proportion of pregnant uteri with well-defined ingrowths and hyperchromatism do not permit a dogmatic statement to be made with regard to its significance as an antecedent to cervical cancer. No conclusive sequence of changes from this remarkable epithelial hyperplasia into true cancer has yet been observed. However on

the basis of similar phenomena in the gall bladder the breast and the alimentary tract, the author suggests that the production during pregnancy of solid tongues of proliferating epithelial cells in discrete areas of the cervical mucosa may constitute an important link in the chain of causative factors in the later development of uterine malignancy. The question of the interrelationship of such epithelial variations and sequential chronic inflammatory conditions he leaves unanswered. If his theory is correct proper care of the endocervix in the post-natal clinic is of importance in the prophylaxis of cancer of the uterus. The endocervix should be carefully inspected and any vascular or granular area in its substance should be given immediate attention.

EDWARD L. CORWELL, M.D.

Rochet, R.: The Treatment of Carcinoma of the Cervix in Pregnancy (A propos de la thérapeutique du cancer du col utérin au cours de la gestation). *Rev. franç. de gyn. & d'obst.* 1933 xlvii, 320.

The incidence of cancer of the uterine cervix in pregnancy is variously reported as 1 case in from 1,000 to 5,000 cases of pregnancy. Without doubt, pregnancy has a very unfavorable influence on the growth of the tumor. Of 15 women whose cases are reviewed by the author only 1 survived three years. The rest showed evidence of recurrence within from twelve to eighteen months.

Unlike non-gravid women pregnant women with cervical cancer (who are usually multiparae) generally present themselves for treatment early because of the repeated bleeding. Even then the diagnosis is often delayed because of failure of the physician to make a proper pelvic examination.

If the cancer is operable the presence of pregnancy does not constitute a contra-indication to operation. In the decision as to treatment, the age of the pregnancy, the degree of operability and the wishes of the woman must be taken into consideration. The natural swelling of the pelvic structures associated with pregnancy may make the tumor seem more widespread than it is.

Two methods of treatment are possible—surgery and irradiation. Operative treatment consists of total hysterectomy according to the method of Wertheim. During the first five months of pregnancy operation is performed with no regard for the fetus. Later irradiation may be carried out. At the end of eight months, operation may be delayed until term. Delivery should be effected by cesarean section, whether the child is viable or not, as labor has a deleterious effect. After delivery, further treatment should usually be delayed until the discharge of lochia has ceased.

During the sixth and seventh months of pregnancy radium may be used in order to avoid sacrifice of the baby which would be necessary with surgery. In this period the extent of the cancer must be taken into account. If the cancer is operable but progressing rapidly total hysterectomy with sacrifice of the fetus is necessary. If the cancer is operable

but progressing slowly the author applies radium to its surface, allows the pregnancy to continue until the child is viable, delivers the child by cesarean section, and then performs a total hysterectomy. When the tumor is inoperable whatever the stage of the pregnancy the author applies radium to its surface, allows the pregnancy to go to term, delivers the baby by cesarean section, and then places radium in the canal. Radium must never be placed in the uterine canal when the baby is viable. If it is possible to carry out a complete extirpation after delivery, a wide total hysterectomy is indicated; otherwise a subtotal hysterectomy should be performed.

Carcinomata discovered after delivery should be treated as though there had been no pregnancy.

JOHN W. EYTON, M.D.

LABOR AND ITS COMPLICATIONS

Bourne, A., and Bell, A. C.: Uterine Inertia. *J. Obst. & Gynaec. Brit. Emp.*, 1933, 21, 423.

The authors believe that most of the disasters of delivery can be ascribed to failure of the dilating and expulsive forces of the uterus. Feeble contractions are the chief cause of the delay. A feebly acting uterus is unable to flex and rotate the child from an occiput posterior position or to force down the soft breech.

In a review of the records of 4,500 consecutive deliveries the authors found only 49 cases of true primary inertia in which the delay of labor was due solely to ineffectual uterine contractions with or without rigidity of the cervix. Long labor was based on a first stage of forty-eight hours or more.

In the majority parity not maturity was the determining factor; the condition being 5 times more common in primiparae than in multiparae. In primiparae the membranes usually rupture prematurely.

There are 2 definite uterine actions in labor. One is the active contraction of the fundus which after labor begins gradually increases in strength and the other a coincidental relaxation of the cervix. When both actions are perfectly co-ordinated there is a so-called normal labor of average duration. If the cervical relaxation is unduly marked, the cervix is dilated perhaps to a diameter of $1\frac{1}{2}$ in during the last month of pregnancy without uterine contractions felt by the patient. Such conditions occur only in multiparae and are often followed by quick, even precipitate labor.

The factors influencing the strength of the uterine contractions include nervous inhibition by the sympathetic, proper working of the local cervical reflex and possibly endocrine secretions. It is probable that healthy uterine muscle has a uniform capacity for contraction. In the stimulation of the cervical reflex factor the engaging and pressing fetal head is of importance. When the head is floating above the brim the pregnancy is often prolonged. In some cases of occiput-posterior position labor is slow not

because of malproportion or mechanical factors but because of feebleness of the contractions.

If the uterus acts strongly the head is flexed and rotated. Labor is often slow because the pressure of the head on the cervix does not arouse the cervical reflex by which contractions are stimulated.

Pituitrin stimulates and adrenalin inhibits uterine contraction.

In some cases of uterine inertia the cervix has a preponderance of fibrous tissue whereas in others it entirely lacks muscle tissue. The term rigid applied to the cervix means a condition of fibrotic inelasticity. In the vast majority of labors delayed dilatation with good contractions is due to spasm of the cervix and not to fibrosis.

In the majority of cases of inertia the treatment demands patience and the use of sedative drugs. The chief danger lies in too early interference which causes lacerations, shock, hemorrhage and sepsis.

Fear stimulates the liberation of adrenalin with its inhibiting effects on uterine action. The frightened woman usually has a difficult labor. Therefore encouragement and the development of confidence are important antenatal factors. If labor begins slowly with anxiety and an exaggerated response to contractions morphine and scopolamine should be given as soon as possible.

When the patient has progressed alone with inertia as long as permissible the manual dilatation of the cervix and the exact position of the head should be determined under anesthesia before active interference is undertaken.

The majority of cervixes are easily dilated. The cervix should be pushed up over the head and slow delivery completed with the forceps.

If the cervix is not dilatable but all other conditions are good, lower segment cesarean section may be performed.

If the child is dead its head should be perforated, a cranioclast affixed and delivery effected by continuous weight traction. CHARLES F. DuBOIS, M.D.

Snoeck, J.: Rupture of the Uterus After Corporal Cesarean Section (Rupture utérine après césarienne corporéale). *Bruxelles méd.*, 1933, xiii, 730.

From a study of twelve cases of rupture of the uterus after corporal cesarean section the author draws the following conclusions:

1. The signs of uterine rupture after a classical cesarean section are generally those of peritoneal irritation without grave symptoms of shock or hemorrhage.

2. The principal factor responsible for the rupture is poor quality of the uterine scar. Other factors mentioned in the literature such as overdistention of the uterus, violent uterine contractions during prolonged labor and the insertion of the placenta over the uterine scar are of secondary importance. They are generally not sufficient to explain the accident by themselves.

3. The frequency of uterine rupture after the classical cesarean section is an important argument

for the use of the low cesarean section in preference to the high cesarean section even in clean cases.

ISAAC ANDRUSKAT, M D

Delmas, P: The Use of Spinal Anesthesia in Operative Obstetrics (*L'utilisation de la rachianesthésie en obstétrique opératoire*) *Gazette des hôpitaux* 1933 xvii.

Delmas claims that he was the first to determine the action of spinal anesthesia on the anterior nerve roots. This action produces a so-called akinesia, or loss of motor function. Delmas also established the fact that the degree and height of spinal anesthesia depend upon the amount of anesthetic fluid employed.

He uses scurocaine, injecting it through a puncture in the lumbosacral region. He injects 5 ccm for a limited spinal anesthesia and 10 ccm for an extensive spinal anesthesia. He describes his technique in detail.

The limited anesthesia is used by Delmas preferably during the expulsive stage of labor. It is satisfactory for the use of forceps, breech extractions, and perineorrhaphies. Under the extensive spinal anesthesia all types of cesarean sections and versions can be done.

Spinal anesthesia is sometimes supplemented by:

1. The inhalation of amyl nitrite during the anesthesia to prevent bulbar symptoms.

2. The prophylactic use of ergotin (Guérin Valma) two hours after the spinal anesthesia to prevent vascular atony.

3. The intravenous injection of 40 ccm of distilled water (Leriche) in the days following the anesthesia to prevent late headaches.

Delmas states that in 5000 cases of spinal anesthesia he was not obliged to use any of these aids.

ISAAC ANDRUSKAT, M D

PUERPERIUM AND ITS COMPLICATIONS

Melandri, V: The Blood Picture During Labor and the First Days of the Puerperium (*Il quadro ematologico durante il parto e nei primi giorni del puerperio*) *Rivista di ginecologia* 1933, vi, 17.

The author discusses the current theories regarding the behavior of the cellular elements of the blood during pregnancy. While there is some diversity of opinion, most authorities agree that pregnancy is accompanied by a decrease of the erythrocytes, either relative or absolute and with the latter a decrease of the haemoglobin content of the blood. With regard to the leucocytes there is more universal accord. It is agreed that a leucocytosis occurs during pregnancy, reaches its maximum during labor, and rapidly diminishes during the puerperium. The leucocytosis is due chiefly to an increase in the polymorphonuclear neutrophils. Basophiles and eosinophiles are scarce or absent. The lymphocytes show a diminution during pregnancy and labor followed by a return to normal in the first few days of the puerperium.

The results of the author's investigation in the cases of twenty women are reported. The blood counts were made during labor three times daily at regular intervals on the first day after delivery, twice daily on the second day, and once on the third, fourth, and fifth days. The blood was obtained from the finger.

During labor the erythrocyte count ranged from 3 to 3½ millions in two cases, from 3½ to 4 millions in four cases, and from 4 to 4½ millions in nine cases. In one case it was above 5 millions. The average count was 4,324,600. In fifteen cases the count was below the normal. During the first day of the puerperium twelve cases showed a decrease in the erythrocytes below the level for labor, a reduction averaging 180,000 cells. During the second day very little change was evident, but on the third day there was an appreciable increase toward the normal.

During labor the haemoglobin varied from 49 to 75 per cent and averaged 60.9 per cent. In each case it remained quite constant. The leucocytes ranged from 9,500 to 23,000 and averaged 14,533. The differential count showed the percentage of polymorphonuclear neutrophils to range from 80 to 90 and the average percentage of lymphocytes to be 11.7. No eosinophiles were demonstrable during labor.

During the puerperium the haemoglobin was found to parallel the erythrocytes, showing a gradual increase toward the normal on the third day. The leucocytes, although varying considerably, tended to decrease as early as the first day. The differential count also began to approach normal on the first day.

In examinations of the retroplacental blood the results were found to be both typical and constant. In each case the changes in the erythrocytes and haemoglobin were similar to those in the erythrocytes and haemoglobin of the peripheral blood. However, while the peripheral blood showed a leucocytosis, the number of leucocytes in the retroplacental blood ranged from 3,000 to 7,800 and averaged 5,292. The differential count showed the same relative proportions as the peripheral blood.

GEORGE C. FURCA, M D

Glennell, L: Anatomoclinical Contributions to the Study of Infarcts of the Hypophysis in Puerperal Women (*Contributo anatomico clinico alle sindromi dell'infarto della ipofisi durante il puerperio*) *Rivista di ginecologia* 1933, xi, 533.

In recent years there has been a vast accumulation of literature on the function of the hypophysis and the activity of its secretion. The clinical changes which follow dysfunction of the gland are very easily identified, but the anatomopathological lesions are not so easily recognized.

In 1915 Simmonds described the clinical picture of hypophyseal cachexia so well that in 1923 Lichwitz proposed calling the condition Simmonds disease.

Di Guglielmo in a monograph on the neuro-hypophyseal syndrome described the clinical picture of Simmonds disease as characterized by malnutrition, cachexia, asthenia, somnolence, precocious senility, apathy, lowered blood pressure and changes in the skin.

Simmonds disease is very rare. In 1925 Graubner was able to collect only thirty four cases. Recently the number of cases on record has increased but in many instances there was no autopsy report to confirm the clinical diagnosis.

Simmonds suggested that syphilis may be an important cause of the condition as he found it in 42 per cent of the cases and Schmidt found it in 57 per cent.

The author reviews cases of hypophyseal cachexia which were reported by Costantini, Lucacer, Calder and others.

In 1914 Simmonds collected thirteen cases of circumscribed necroses of the hypophysis following puerperal infection. In eleven the lesion was an embolic process. Seven of the embolic processes were in the anterior lobe and four were in the posterior lobe. In two of the seven cases of involvement of the anterior lobe there was an infarct from a disturbance of the circulation and in the five others there were microscopic emboli.

The author finds it difficult to explain the frequency of the infarcts in hypophyseal areas but suggests that it may be dependent upon the circulation of the hypophysis.

Two cases coming under Giromella's observation are reported. The first was that of a woman of forty years who had had amenorrhea for four months, a very high fever, sharp pains in the joints especially the right knee, for several days and vaginal spotting and pain in the lower part of the abdomen and across the back for the last twenty-four hours. Development in childhood had been normal. Examination revealed a pregnancy of four months, duration and manifestations of acute rheumatic fever.

The course was very febrile. The patient aborted a four months macerated fetus after several days in the hospital and died on the sixteenth day.

Autopsy disclosed enlargement of the heart, many subepicardial punctate hemorrhages, two large friable vegetations on the mitral valve, a turbid myocardium, enlargement of the kidneys, several renal infarcts, renal pus and a purulent exudate in the uterus. On section the hypophysis showed an infarcted area in the posterior lobe. The anterior lobe and pars intermedia were uninvolved.

The second case was that of a gravida viii thirty-four years old. The patient's development had been normal. The last menstrual period occurred May 25, 1932. The patient entered the clinic December 28 because of spotting which had gradually increased to a considerable hemorrhage which lasted about an hour and then ceased abruptly. The findings of the general physical examination were negative except for the changes incident to pregnancy.

On vaginal examination an eight months pregnancy was found. The fetal outlines were palpable. A diagnosis of placenta previa was made. The bi-manual examination was followed by considerable hemorrhage. A cervical cesarean section was done. Death occurred the following morning.

At autopsy, the hypophysis was found enlarged and its capsule was bluish red, suggesting an underlying hemorrhage. The usual pregnancy changes were present. The anatomicopathological diagnosis was anemia of extreme degree in a woman operated upon by cesarean section for placenta previa in infarct of the hypophysis (?) hemorrhage into the hypophysis (?). Microscopic examination disclosed, in the glandular portion of the hypophysis, a blanched and opaque triangular zone with its apex toward the center and its base toward the periphery. This was in marked contrast to the rest of the gland, which was red. A diagnosis of infarct of the hypophysis was made.

The author believes that in the first case the process was undoubtedly embolic and in the second it was thrombotic.

GEORGE C. FINOLA, M.D.

MISCELLANEOUS

Eastman N. J. Progress in Obstetrics. *Internal Clinical Clinics* 1933 II 258

According to reliable statistics 1,000 women die annually in the United States from heart disease complicated by pregnancy and 1 per cent of all pregnant women have heart disease.

Gammeltoft and others have found that during pregnancy the normal heart increases its minute output from 40 to 50 per cent. There is also a proportionate increase in the total blood volume to fill the newly vascularized area in the uterus. Accordingly the heart must perform about 50 per cent more work during pregnancy than in the non-gravid state and must hypertrophy and dilate. Ordinarily the large cardiac reserve allows easy compensation in pregnancy but increased effort through exercise may cause dyspnea.

The growing uterus and elevation of the diaphragm in pregnancy cause displacement of the heart toward the left upward and in the direction of the anterior chest wall rotation of the heart. Systolic murmurs in the absence of a history of recent rheumatic fever which are usually heard loudest over the base are noted when the woman is in the standing position as well as when she is recumbent, and are due to the diminished size of the retrosternal space which brings the larger vessels anterior to transmit the course of coursing blood to the chest wall and accentuation of the pulmonary second sound through rotation of the heart which brings the pulmonary valve close to the anterior chest wall and hence renders its closure readily audible. Extrasystoles, crepitant rales in the lung bases due to stasis and engorgement of the neck veins due to an increased venous blood pressure may also be present normally.

The signs of a pathological heart in pregnancy include a crescendo presystolic or characteristic diastolic murmur, a precordial thrill or definite "purr" an irregular rhythm persisting after exercise, especially if the rate is 120 or above, a precordial friction rub, and an expansile pulsation of the liver due to a relative tricuspid insufficiency.

The prognosis depends upon the functional capacity of the heart or the cardiac reserve. According to their response to dumbbell exercises Pardee classifies patients with heart disease as follows:

Class 1: Patients with organic lesions who are able to carry on ordinary physical activity without discomfort. Exercise may cause moderate dyspnea and tachycardia, but these subside within two minutes. Pregnancy, labor and the puerperium are experienced without untoward event.

Class 2: Patients with organic lesions who are unable to carry on ordinary activity without discomfort.

Subclass 2A: Patients whose activity is restricted as, on exercise they develop dyspnea and tachycardia persisting for three minutes or more. These patients usually undergo labor safely with occasional mild cardiac embarrassment.

Subclass 2B: Patients whose activity is greatly restricted as they experience fatigue, palpitation, and dyspnea after less than ordinary activity. Such patients show physical signs of congestive heart failure or active heart infection, and frequently develop it before the puerperium is ended.

Class 3: Patients with organic lesions and symptoms of heart failure even during rest. A super-

imposed hypertension or auricular fibrillation is always grave.

In cases of Class 1 and Class 2A the patient should have ten hours of sleep nightly and should rest for half an hour after meals. Light housework and walking on the level may be permitted. Infection must be avoided. At the first signs of heart failure, such as persistent rales at the lung bases after several deep breaths or dyspnea or exertion, absolute bed rest is imperative. During labor digitalis should be withheld until indicated, and delivery should be performed only after complete cervical dilatation. Persistence of the cardiac embarrassment requires forceps delivery under anesthesia induced with ether by the drop method. A tight binder on the abdomen following delivery will prevent sudden cardiac collapse at this stage by preventing splanchnic engorgement. All women with heart disease should be kept in bed for three weeks after delivery.

In cases of Class 2B frank heart failure at any time during pregnancy requires absolute bed rest for the remainder of the pregnancy, and cesarean section under local infiltration anesthesia is the method of choice for delivery. The Trendelenburg position should never be used. As a rule, therapeutic abortion is necessary.

The treatment of cases of Class 3 resolves itself into the treatment of heart failure. The maternal mortality is over 50 per cent whatever method of delivery is used. Decompensation must be over come. Undoubtedly delivery is best effected by cesarean section under local infiltration anesthesia.

HAROLD V. BELL, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Kindall, L. Pyelitis Cystica and Ureteritis Cystica. Report of a Case Diagnosed by Urography and Confirmed by Biopsy With an Outline of Treatment. *J. Urol.*, 1933 xxix, 645

In the case of pyelitis and ureteritis cystica reported by Kindall symptoms of obstruction were relieved and the number of cysts decreased by the passage of large ureteral catheters and the instillation of silver nitrate solution. ANDREW McNALLY M.D.

BLADDER, URETHRA, AND PENIS

Kutzmann A. A.: Diverticulum of the Urinary Bladder; An Analysis of 100 Cases. *Surg. Gynec. & Obst.*, 1933 lvi, 898

Diverticula of the urinary bladder are commonly diagnosed by cystoscopic and X ray examinations.

According to some, the diverticula are congenital whereas according to others they are acquired.

The walls of the diverticula are composed of fibrotic and connective tissue fibers permeated by inflammatory elements. As a rule they have a smooth glistening lining membrane unlike the bladder mucosa and showing histologically a flattened type of epithelium.

There are no pathognomonic symptoms of diverticula of the bladder.

In most cases treatment has consisted of measures to relieve obstruction. When retention occurs there is urinary stasis with later infection.

The author reports a study of 100 cases seen during the past five years. The majority of the patients were males at the age of greatest frequency of prostatic conditions and in most of the cases obstruction was present.

The incidence of diverticulum of the bladder is 1.2 per cent in urological cases in general, 0.1 per cent in cases of benign hypertrophy of the prostate, 16.8 per cent in cases of contractures and median bar obstruction of the bladder, 14.3 per cent in cases of urethral stricture necessitating operation and 1.1 per cent in cases of carcinoma of the prostate.

ELMER HERS, M.D.

Goldin E.: Primary Extraperitonization of the Bladder—Voelckers Procedure—and Secondary Extraperitonization of the Bladder—Papin's Procedure (Extraperitonisation primitive de la vessie—procédé de Voelcker—et extraperitonisation secondaire de la vessie—procédé de Papin). *Arch. d. mal. de reins et d. organes génito-urinaires*, 1933 vii, 129.

Before describing Voelckers and Papin's procedures Goldin reviews the anatomy of the bladder

and the adjacent parts of the abdominal wall and peritoneum and discusses the various routes by which the bladder is approached surgically. The routes of approach are:

1 The anterior route, between the symphysis pubis and peritoneal cul-de-sac. This limited space is sometimes enlarged by resection of the pubic bone division of the symphysis with a Gigli saw or opening of the peritoneum.

2 The upper or transperitoneal route. The two techniques described in this article are modifications of this route.

3 The basal route. In the male the approach is made through the penneum, and in the female through the vagina.

Voelckers' and Papin's procedures are both based on the anatomical fact that the bladder is an extra-peritoneal organ, but is closely adherent to the peritoneum posteriorly. By these techniques it is possible to explore the entire bladder while protecting the abdominal cavity from contamination.

The steps in primary extraperitonization, Voelckers' procedure, are as follows:

1 The abdominal wall is divided by a median or a transverse incision.

2 The peritoneal cul-de-sac is identified, the landmarks being made to stand out more clearly by gently distending the bladder with liquid or air.

3 The urachus and umbilical vessels are divided.

4 The peritoneum on the upper surface of the bladder is incised and the bladder raised.

5 From the ends of the first incision a second incision is made with its convexity toward the neck of the bladder and close to the point where the peritoneum is reflected over the seminal vesicles or uterus.

6 The opening thus formed in the peritoneum is sutured so that the abdominal cavity is entirely shut off from the operative field.

7 The bladder and ureters are explored and after the removal of tumors or stones are replaced without disturbing the peritoneum.

The indications for this operation are: (1) tumors of the bladder or ureters, (2) diverticula, (3) calculi in the ureters close to the bladder (particularly bilateral calculi), (4) vesicovaginal fistula, and (5) total nephro-ureterectomy.

The steps of secondary extraperitonization of the bladder, Papin's procedure, are as follows:

1 The abdominal incision is made through the skin, aponeurosis, muscles, and peritoneum.

2 The abdominal contents are protected from contamination by packs and the bladder is opened.

3 The peritoneum and abdominal wall are closed layer by layer so that the opening into the bladder is placed outside the peritoneal cavity.

This procedure is indicated for cases of tumor of the anterior bladder wall in which partial cystectomy is performed, diverticula of the urachus large calculi, and fistula.

The author reports ten cases in which the Voelcker procedure was used and nine in which the Papin method was employed. The article has a good bibliography and numerous illustrations.

MAXIM W. POOLE, M.D.

Wataon, E. M.: A Study of Carcinoma of the Lower Urinary Tract. *J. Urol.* 1933 xxix, 345

Watson reviews cases of carcinoma of the lower urinary tract which were treated by non-surgical procedures. Among them were 214 cases of carcinoma of the bladder. In 35 of these the carcinoma was of the papillary or undifferentiated type. In 57 per cent of the latter the growth had become so large that it could be felt through the rectum or the vault of the vagina on digital examination. Thirty-two of the 35 cases were treated by various combinations of radium irradiation, deep X-ray irradiation, and electrocoagulation. Three of the patients refused treatment and 5 could not be traced after they had been treated for seven months. Of the 24 who were traced after treatment, 3 are alive and free from recurrence. In the cases of the 21 who are dead the period of survival after the beginning of treatment averaged eight months.

Adenocarcinoma of the bladder was treated by deep X-ray irradiation and irradiation with radium seeds introduced with the cystoscope. One of the patients died at the end of one month and another at the end of six months.

There were 134 cases of mucous membrane epithelioma of the bladder. This is a deeply infiltrating and rather rapidly growing tumor. Eighty-nine of the patients with such a tumor were men. Twenty-one had had a previous suprapubic operation for bladder tumor and 1 had had 3 operations. In 73 (53 per cent) of the cases the tumor could be felt through the rectum or the vaginal wall at the time of the patient's admission to the hospital. The treatment consisted of combinations of deep X-ray irradiation, irradiation with radium seeds applied with the cystoscope and irradiation with radium packs. Four of the patients were not treated. Ninety are known to be dead and 39 are alive. Of the latter, 25 are free from recurrence and 14 still have varying amounts of tumor tissue.

In 24 of the cases reviewed the bladder tumor was a malignant papilloma. This tumor is characterized by a papillary arrangement of the cells. Twenty of the patients were men. The average duration of occasional hematuria before the patient came to the hospital was seven and a half years. In 5 cases the tumor could be felt through the rectal wall or the vaginal vault. Following treatment, 3 of the patients could not be traced after they had been free from tumor for periods of time ranging from eight months to seven years. Fourteen died after surviving for an average of two years and one month after

the beginning of the treatment. Of the 7 who are still alive 6 are free from tumor.

There were 13 cases of massive papillary bladder tumors in which the cells suggested, but lacked the definite characteristics of malignancy. Ten of the patients were men. Four patients, who were free from tumor when they were last seen, could not be traced. The treatment consisted of radium and deep X-ray irradiation. One patient died at the end of one year and five months. Eight were alive and free from tumor from one to seven years after the treatment.

In 11 cases the tumor was a carcinoma of the urethra. Nine of the patients were men. The treatment consisted of deep X-ray irradiation, radium seed implantation, and the use of heavy radium packs. Three of the patients died after surviving for an average of twelve months from the beginning of treatment. Three are alive and free from tumor.

One hundred and ninety-four cases of carcinoma of the prostate were treated with radium, deep X-ray irradiation and radium packs. Eleven patients with this condition refused treatment. Of those treated, 20 are alive after an average of eleven months since the beginning of treatment. One died after eight years and one month, and another died after ten years and four months.

Eighteen additional patients are still under treatment. Of those with prostatic carcinoma, 20 are living, but show evidence that the disease is still present.

ELMER HEN. M.D.

Pedroso Macosfán, A.: Ten Cases of Cancer of the Penis (Diez casos de epiteloma del pene) *Arch. de med. ciruj. y especial.* 1933 xlv 431

Epithelioma of the penis is rare as compared with epithelioma in other parts of the body. Its incidence among all malignant neoplasms treated in the San Juan de Dios Hospital has been 2 per cent. It is most frequent at about the fifty-fifth year of age. In 60 per cent of the cases there is a history of phimosis.

Phimosis results in certain conditions which are to be regarded as predisposing to cancer. There is retention of smegma and septic products in the preputial cavity which leads to a constant discharge and itching. The patient may become accustomed to the discharge and suspect nothing until it becomes profuse and foul-smelling. The irritation becomes severe, or a palpable tumor appears beneath the preputial skin. Pain is usually not an early symptom.

Benign vegetations often precede the appearance of cancer, but as no change in the symptoms is noted until an intractable ulceration develops, a series of unsuccessful local treatments is usually given before the correct diagnosis is made.

The rôle of syphilitic ulceration as a predisposing factor is often discussed. Some authorities deny that such ulceration has any influence whatever, while others claim that they have frequently observed malignant degeneration in syphilitic lesions of the penis. Apparently cancer has developed in neglected syphilitic lesions and probably also from chancroids.

Therefore any unhealed genital ulcer should be regarded as potentially malignant.

As a rule patients with cancer of the penis neglect the condition until the lesion is well advanced, probably because of the fear that amputation will be recommended. Some still perform coitus after the development of large necrotic ulcers. As in cancer of other parts of the body pain is the symptom which most frequently causes the patient to seek treatment.

The author reports ten cases. He recommends radical amputation with removal of the inguinal glands and subsequent intensive radiotherapy when ever it is possible.

WILLIAM R. MEXTER, M.D.

GENITAL ORGANS

Nora, G.: Tumors of the Tunica Vaginalis (Tumeurs de la vaginale) *J d'uroi méd et chir* 1933 xxxv 5

The author considers only primary tumors of the tunica vaginalis which are quite rare. He reviews their history and abstracts a number of the case reports appearing in the literature. In the first case recorded which was reported by Poisson in 1858 the tumor was a fibroma. The most common tumors of the tunica vaginalis are sarcomata and the next most common fibromata. The occurrence of cysts and lipomata in the tunica vaginalis is questionable. Including the case reported in this article, five cases of endothelioma are known.

The author's patient was a boy eighteen years of age who sought treatment for a tumor in the right side of the scrotum which began to develop in January 1929 and had increased in size for three months. The neoplasm did not cause any pain or other symptoms. It was troublesome only on account of its size. Physical examination disclosed enlargement of the scrotum and a tumor back of the testicle. The tumor was made up of two nodules the lower one the size of a pigeon's egg and the upper one twice as large. A diagnosis of tuberculous epididymitis was made. At operation both the testicle and epididymis were found normal. The tumor was discovered to be implanted on, and to have arisen from the parietal tunica vaginalis. Epididymectomy was performed with total resection of the tunica vaginalis. At no point did the specimen show continuity of the tumor with the epididymis. Histological examination proved the neoplasm to be an endothelioma. Eight months later there was a local recurrence, evidently from a bit of the tunica left behind. This was removed and when the patient was seen in June 1930 he was apparently free from recurrence.

Tumors of the tunica vaginalis are rarely diagnosed before operation. When a pre-operative diagnosis is made and the testicle and epididymis are in tact, simple removal of the tumor may be possible but in the great majority of cases total epididymectomy is indicated.

The tunica vaginalis is made up of two layers one a connective tissue layer containing elastic fibers and covered with muscle fibers and the other a single layer of endothelial cells resting on a thin chorion

Therefore it may give rise to various forms of tumor. Recently Chevassu has suggested that tumors of the tunica vaginalis may arise from embryonic rests at the periphery of the tunica near the testicle and epididymis.

AUDREY GORE MORGAN M.D.

Tagliaferro P. The Aschheim Zondek Reaction in the Diagnosis of Malignant Tumors of the Testicle (La reazione di Aschheim e Zondek nella diagnosi dei tumori maligni del testicolo) *Arch ital di urol* 1933 x, 171

The author reports two cases in which the Aschheim Zondek test was of aid in the diagnosis of malignant testicular tumors. However on the basis of his own experience he is unable to ascribe any value to this test in the prognosis of such tumors.

EGOROK T LENDY M.D.

MISCELLANEOUS

Cicceri C. Observations on Colibacilluria and Colon Bacillus Infections of the Urinary Tract Secondary to Appendicitis (Osservazioni di colibacilluria e di infezioni colibacillari dell'apparato urinario di origine appendicistica) *Arch. ital di urol* 1933 x, 117

Cicceri reports six cases of appendicitis in females and four in males in which elimination of colon bacilli through the kidney caused functional and anatomical changes in the urinary tract. The urinary symptoms in such cases are severe or mild acute or chronic, depending on the virulence of the organisms. As a rule the involvement of the urinary tract soon clears up after appendectomy but in an occasional case special surgical treatment of the urinary tract is necessary.

EGOROK T LENDY M.D.

Barbellon and Lebert: The True Value of the Complement Fixation Test for Gonorrhoea (Valeur actuelle de la gonoréaction) *J d'uroi méd et chir* 1933 xxxv 97

Following a brief review of the history and use of complement fixation tests in gonorrhoea the authors cite the following facts regarding the test.

- 1 As a rule the reaction is negative when the patient is cured of gonorrhoea.
- 2 Occasionally it may be negative in the presence of proved gonorrhoea.
- 3 Positive reactions usually mean the presence of gonorrhoea.
- 4 Syphilis may cause a false positive reaction.
- 5 Pregnancy renders the test worthless.

The authors believe that the test should be used in all cases of urethritis, epididymitis, rheumatism, and pelvic inflammatory disease in which the usual methods of examination do not disclose the cause and should be employed routinely before marriage.

JOHN W. EYRON M.D.

Joly J.B. Bilateral Urinary Calculi *Proc Roy Soc Med., Lond.,* 1933 xxvi 913.

Joly discusses only cases of urinary calculi in which stones are found on both sides at the same

time. Such cases constitute 9.4 per cent of the cases of stone in the upper urinary tract which are admitted to St. Peter's Hospital, London. In Continental clinics their incidence varies from 11 to 14 per cent. According to postmortem records, it is nearly 50 per cent.

Four groups of cases are discussed as follows:

1. Cases of calculi due to a special diathesis such as cystin stones. Cystinuria should be treated by diet and the administration of alkalis. However stones may form in spite of such treatment. They can be passed easily. Operation is indicated only when impaction occurs.

2. Cases of infected bilateral calculi. When both sides are infected the calculi are often very large and the kidneys severely damaged. Infection is usually the primary factor but its source cannot always be determined. The symptoms are mild. Often the only sign of the condition is a passing pyuria. If the function of both kidneys is the same, operation may be impossible. Pelvic stones should be removed. Stag horn calculi should be left alone unless there is evidence of fluid distention of the kidneys. When the function of the kidneys

is unequal, an absolutely useless pyonephrotic kidney should be removed or drained, but if urine is secreted by both kidneys it is advisable to operate on the better kidney first.

3. Cases of aseptic bilateral calculi. The calculi in such cases are comparatively small, and it is rare to find more than one stone on each side. If the function of the kidneys is approximately the same simultaneous removal of the stones is advisable. When this is impossible the interval between the two operations should not exceed four teen days. When the function of the kidneys is unequal, the first operation should be performed on the more damaged kidney.

4. Cases complicated by anuria. In cases of calculous anuria the obstruction is usually found in the upper portion of the ureter. An attempt should be made to relieve it by the passage of ureteral catheters. If this procedure fails or if the anuria recurs, immediate operation is necessary. The kidney which was obstructed last should be drained. The stones should be removed as soon as the effects of the anuria have passed off.

ANDREW McNALLY M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES JOINTS MUSCLES, TENDONS ETC

Thomas, H. M., Jr.: Acropachy; Secondary Subperiosteal New Bone Formation. *Arch Int Med.*, 1933 II 571

A colored man twenty two years old was admitted to the hospital in November 1926 suffering from a rather severe form of diffuse goiter with hyperthyroidism which had been present for about two years. Following the usual pre-operative treatment and operation the basal metabolic rate fell from the admission level of 50 per cent above normal to 3 per cent below normal and the patient gained 26 lb. After his discharge from the hospital he gained about 30 lb more in eight months. At the end of that length of time he noticed clubbing of the fingers and a change in the swelling of his ankles which previously transitory had become constant and firmer. The changes gradually became more marked and there was slight pain on vigorous movement of the hands. In 1929 the basal metabolic rate was -9 per cent and roentgenograms showed the laying down of new bone under the periosteum of the bones of the hands and feet and the long bones of the extremities. In April, 1931 the basal metabolic rate was -20 per cent and the new bone formation had become more extensive. A diagnosis of postoperative hypothyroidism with secondary hypertrophic osteoarthropathy was made and supplementary thyroid therapy was instituted. This treatment resulted in improvement in the symptoms. While no definite change has been noted in the bones since the patient began to take thyroid, thinning of the subperiosteal new bone was suggested after three and a half months.

The author states that this is the first reported case of clubbing of the fingers with subperiosteal new bone formation occurring in association with disease of the thyroid gland. Hitherto this condition has been described as secondary to suppurative intrathoracic lesions, mediastinal new growths, lung tumors, abscess of the liver, pyelonephritis, cirrhosis of the liver with jaundice, certain obstructive lesions of the gastro-intestinal tract, syphilis, or congenital heart disease. The case reported presented none of these features.

Nothing is known about the mechanism of the bony change in this syndrome. Thomas concludes that the most common cause is a change in the blood flow.

NORMAN C. BULLOCK, M.D.

Pyrah, L. N. and Pain, A. B.: Acute Infective Osteomyelitis. A Review of 262 Cases. *Brit J Surg.*, 1933 XX 590

The authors review 262 cases of acute infective osteomyelitis which were seen in the General In-

firmary at Leeds, England in the ten year period from 1921 to 1930. The total mortality was 27.1 per cent. The yearly number of cases was fairly constant. The number of males with the condition was more than twice the number of females. The great majority of the patients were between the ages of five and fourteen years. The most common sites of involvement were the upper end of the tibia (62 cases), the lower end of the femur (66 cases), the lower end of the tibia (27 cases), the upper end of the femur (22 cases), the lower end of the fibula (15 cases), and the lower end of the radius (13 cases).

The great frequency of the disease in the neighborhood of the knee joint is explained by the frequency of trauma and sprains in that region, the good metaphysical blood supply, and the size of the epiphysis. In most other series of cases the incidence of the disease in the humerus was much higher than in this series.

In many of the cases reviewed by the authors a history of trauma, either a blow or a sprain was elicited. As a rule the injury was sustained in the last two weeks. Also frequent was a history of a recent exanthem or a superficial infection. In many cases the child had been fretful and ill for several days before the onset of the pain.

In 90 per cent of the cases in which a bacteriological examination was made the staphylococcus aureus was found to be the causative organism.

Of the 71 fatal cases autopsy was performed in 51. In all except 6 of the latter pyemic lesions were found. Mentioned in order of decreasing frequency the most common findings were pericarditis, abscesses or infarctions in the lungs, renal abscesses, acute pleurisy and empyema. Twelve patients recovered after treatment of pyemic lesions: 1 after drainage for empyema and 1 after drainage for pyopericardium.

As a rule the symptoms had been noted for less than seven days before the patient's admission to the hospital. While in many of the cases the temperature was below 100 degrees F. in the majority the pulse rate was 120 or more.

The diagnosis was usually easy except when the lesion was at the upper end of the femur. An important sign of involvement of the upper end of the femur is tenderness over the trochanter and in Scarpa's triangle. The authors call attention to the frequency with which osteomyelitis of the small bones of the foot suggests cellulitis of the foot and the correct diagnosis is not made until a draining sinus persists and the foot is examined with the roentgen ray.

All of the cases reviewed were treated surgically. In 64 the operation was limited to simple incision and drainage of the subperiosteal space because the

Infection seemed to be limited or the patient was too ill for further attempts at drainage. In 18 of these cases a secondary operation was necessary. In 20 selected cases primary diaphysectomy was performed with only 1 death. In 8 it was done on the fibula, and in 6 on the radius. In the more acute cases, especially those with involvement of the femur and tibia, the gutter operation was the routine procedure. The removal of bone should extend up into the metaphysis. Of 176 patients treated by the gutter operation, 52 died. Of 2 patients treated by Orr's method both died.

Next to pyemia and septicemia, the most important complication was infection of a neighboring joint. This was most frequent in osteomyelitis of the upper end of the tibia. In the treatment of the latter it is important to carry the periosteal incision up to the epiphyseal line. An infected joint should be opened early if no improvement follows aspiration. Amputation must also be considered early. Of 44 cases in which acute arthritis developed, amputation of the leg was done in 12.

For spreading infection of soft tissues the accepted treatment is rest and the application of heat until localization and pus formation occur, and then incision and drainage. It appears that the same principles should be applied to osteomyelitis. Cases of great severity should be treated by simple periosteal incision. The bone should be opened only when it contains demonstrable pus. The presence of pus in the bone can be determined by exploring with a trephine or drill. Of the cases reviewed, the mortality was lower (15 per cent) in those treated only by periosteal incision than in those in which the gutter operation was performed (29.5 per cent) in spite of the fact that in many cases the more conservative operation was chosen only because the condition of the patient was considered too critical for a more radical procedure.

CHAS. C. GOY, M.D.

Stocum, M. A., McClellan R. H. and Messer F. C.: Investigation into the Modes of Action of Blow Fly Maggots in the Treatment of Chronic Osteomyelitis. *Pennsylvania M. J.*, 1933, xxxv, 570.

It seems to be generally agreed that the presence of live maggots in osteomyelitic wounds removes necrotic tissue promotes healthy granulation, and causes a prompt diminution in the number of bacteria present.

The removal of sloughs has been ascribed to the supposed ability of the maggots to chew or tear the necrotic tissue and to the action of an enzymic substance. It has been reported that an active principle with bactericidal properties may be isolated from a filtrate of crushed maggots. Baer suggested that the diminution of bacteria may be due to the increased alkalinity of the wound secretions which he noted following the introduction of maggots.

The authors have succeeded in showing that maggots produce a secretion with a weak proteo-

lytic action, and that their digestive tract contains a proteolytic enzyme of high potency. The healing process in the wound is dependent partly on the fact that only a weak liquefying solution comes in contact with the patient's tissues, whereas the strong enzyme is present only within the maggot, where it completes the digestion.

The authors studies demonstrated also that maggots have a bactericidal action. A series of bacterial counts made from the wound secretions in cases of chronic osteomyelitis showed that although there was a noticeable fluctuation in the number of bacteria in healing wounds, the general trend was always downward.

It was found that maggots render the wound alkaline by forming ammonia. A relationship between the degree of alkalinity and the number of bacteria was noted.

No bactericidal power could be demonstrated in crushed maggots or extracts of maggot tissue.

NORMAN C. BULLOCK, M.D.

Bromer R. S. and Downs, E. E.: Tuberculosis of the Diaphysis. *Am. J. Roentgenol.* 1933, xiv, 617.

The authors report a destructive tuberculous lesion involving the middle portion of the left fibula of a man seventy-six years of age. When the patient was examined at another hospital because of swelling of the leg, a diagnosis of bone cancer was made and amputation urged. Roentgen ray examination by the authors led to a diagnosis of low-grade osteomyelitis. The Wassermann test was negative. The diagnosis of tuberculosis of the epiphysis was made by aspiration and guinea-pig inoculation. Treatment consisted of deep incision and curettage. Healing resulted promptly and there was no recurrence in fourteen months. Later, however a localized swelling developed at the right elbow and was treated at another hospital by incision and drainage. The patient states that drainage has persisted since then. No guinea pig inoculations were made at that time.

This case report is followed by a review of the literature on lesions of the type described. The condition was reported by Boyer in 1803 under the name "spina ventosa." The tuberculous nature of spina ventosa was affirmed by Nélaton in 1837.

According to their location, tuberculous lesions of the long bones have been divided into two main groups: (1) those in the diaphyseo-epiphyseal region, and (2) those in the diaphysis. The former are the more common. The various theories advanced to explain the frequency of the lesions in these regions are discussed.

The cases and classifications of Hildebrandt, Zumsteeg, Schins, Sorrell, Sorrel-Déjerine, Friedlaender, Allison, Fisher, Juengling, and Greig are reviewed. Cana's modification of Kuettners classification is as follows:

1. a. Primary in the shaft. This may be secondary to a tuberculous focus not in the bone.

- h Primary in the metaphysis and spreading from there to the shaft
- 2 Primary in the joint or epiphysis and spreading from there to the shaft.
 - a. Progressive infiltrating tuberculosis
 - b. Caries cariosa.
 - c. A type similar to a and 'b, but characterized by a chronic course and a better prognosis.

The author believes that the lesion in his case was of the less common second type described by Cahn. This is a peripheral lesion. According to Krause, it occurs most frequently in young persons with other old or recent tuberculous foci. However it may occur also in persons of any age who have shown no previous evidence of tuberculosis. The bones most commonly involved are the humerus, ulna, and tibia.

The following roentgenological classification of diaphyseal lesions is presented:

- 1 Lesions confined strictly to the diaphysis
 - a The destructive superficial type.
 - b The periosteal or productive type, which is much more frequent.
- 2 Lesions involving the diaphysis the metaphysis, and often the epiphysis
 - a. The productive periosteal type
 - b Lesions presenting a large, sharply defined area of rarefaction involving the metaphysis and extending across into the epiphysis.
 - c. Tuberculous osteomyelitis involving the major portion or very often, all of a long bone. ROBERT V FOSTER M.D

Harris H. A., and Russell, A. E. Atypical Growth in Cartilage as the Fundamental Factor in Dwarfism and Achondroplasia. *Proc Roy Soc Med.*, Lond. 1933 xxvi, 779

In an attempt to find an explanation for certain disorders in the growth of bone especially in achondroplasia the authors studied anew the mode of growth of cartilage in the mammalian embryo. Cartilage more than any other tissue in the human body displays a constancy of morphological characteristics. In a study of proliferating cartilage from the ends of the long bones in the human embryo it was found that most active growth as judged from the presence of mitotic figures occurs in a ring shaped zone below the free surface. On passing from this zone of active mitosis toward the free surface toward the center of the cartilaginous epiphysis and toward the shaft the cartilage cells become progressively older. As they become older they undergo degenerative changes those at the center of the epiphysis becoming calcified from deficiency in nutrition. In the diaphyseal region the cartilage cells become arranged in longitudinal and transverse columns with an intercellular matrix which undergoes calcification. Capillaries from the marrow of the shaft invade the zone of cartilage bringing primitive fibroblasts which differentiate into osteoblasts. These remove the calcified cartilage and lay down

bone in the longitudinal and transverse columns or trabeculae. Many of the former and most of the latter disappear but the trabeculae which remain assume the pattern already delineated in cartilage during the earlier process of proliferation. This pattern is hereditary. It is present in the embryo before the development of muscles, and is seen to be present even when the rudiments of the limb of a chick embryo are grown in tissue culture. It is therefore not due to muscle pull, stress or tension, as is assumed on the basis of Wolff's law. The process of calcification in cartilage is regarded as the unique means whereby the hereditary form of bone can be maintained throughout life.

In a study of the ends of the long bones of an achondroplastic newborn infant to determine how the bone growth differed from the normal, it was found that the normal process of calcification in the matrix of the epiphyses was replaced by a mucoid degeneration which occurred in several areas. Between these areas calcification and bone formation took place, resulting in multiple irregular centers of ossification instead of a single center. In the epiphyseal cartilage adjoining the shaft the cells did not arrange themselves in the normal longitudinal and transverse columns, and a dense transverse bar of bone adjoined the marrow cavity.

In a study of the epiphyses of a child of eleven months with congenital deformities it was found that mucoid degeneration was present in the region of the zone of the most active cartilage growth. Where this degeneration occurred there resulted collapse of the epiphyses accompanied by patchy ossification or stippled epiphyses and chronic arrest of growth of the long bones. This pathological picture is most marked in achondroplasia. It is seen also in the vertebrae where it results in irregularities in the size and shape of the vertebral bodies. The cause of mucoid degeneration in cartilage is unknown. CHESTER C. GUY M.D

Stiegel L., and Zachau H.: Studies of the Development of Bony Ankyloses (Untersuchungen ueber die Entstehung knoecherner Ankylosen) *Deutsche Zeitsch f Chir.*, 1933 cccxxx, 205

The nature of the development of bony ankyloses is not yet uniformly explained. We lack especially exact knowledge as to the conditions under which and the form (whether osteoplastic or metaplastic) in which the ossifications occur in the joint. The authors review the prevailing different and partly contradictory views regarding the development of bony and congenital ankyloses, and the importance of arthritis, immobilization and articular trauma in the origin of the former.

They then report their histological studies of ankyloses in tuberculosis gonorrheal arthritis rheumatic processes osteomyelitis (suppurative arthritis) and traumatic conditions (fractures).

New bone formation in the connective tissue originating from the articular capsule was not observed in fibrous ankyloses. From the results of the study

the possibility of a metaplasia of this connecting link of synovial origin into fibrous cartilage may be assumed. The findings permit the conclusion that the cells of the blood vessel walls may become bone-forming cells. The development of a bony ankylosis with persisting articular cartilage occurs most often by enchondral ossification in which osteoblasts from the bone-marrow cells or the cells of the blood vessel walls act as bone formers. A prerequisite for bony union of the cartilaginous articular surfaces changed in this way is the disappearance of the fibrous connective tissue filling the articular space. This is destroyed by pressure or less frequently changes into fibrous cartilage. In addition to this type of ossification there is a direct change of fibrocartilaginous rests of the original articular cartilage in the bone. With complete destruction of the articular cartilage the bone formation proceeds in a germinal tissue growing into the articular space from the opened medullary spaces. F O MAYR (Z)

Pern, H.: The Treatment of the Joint Lesions of Arthritis Deformans. *Med J Australia*, 1933, 1 573.

In cases of joint lesions of arthritis deformans the author follows the line of treatment advocated by Sir Robert Jones which consists of a carefully balanced combination of rest and active and passive motion. He divides the arthritic joints into the following three groups: (1) joints affected by acute inflammation, (2) joints affected by subacute inflammation in its various stages, and (3) stiffened joints with varying amounts of destruction but no apparent inflammation.

In Pern's cases of Group 1 a woolen bandage is applied with some pressure to reduce the swelling and at intervals of from two to four days is removed for a single movement of full range. Weight bearing and painful motion are avoided. If the joint is not put at rest fresh trauma will be produced each time it is moved actively and chronic inflammation will be set up. If rest is prolonged and complete, adhesions will form even though the inflammation is cured.

In cases of Group 2 the joint loses its stability from overstretching of its capsule and weakening of its supports. If active movements are performed the joint is used mechanically incorrectly and further inflammation is set up. The amount of rest required can be accurately estimated from the amount of inflammation present. Until the inflammation subsides there should be very little active movement of the joint. When a patient undertakes his own treatment he may overwork the joint when it has become inflamed.

In discussing the treatment of cases in Group 3 the author takes up the specific treatment of spinal lesions, lesions of the upper and lower extremities, and the joints of the upper extremities. He outlines the types of exercises which he prescribes and discusses mobilization by continuous force by means of appliances, the breaking down of adhesions at

one or two sittings, and the gradual breaking down of obstructions at frequent intervals.

Pern suggests that arthritis may be due to disturbances of the ductless glands, as the severe forms of the acute type occur at a period of ductless gland activity and instability, the mild chronic rheumatism and single joint involvements occur at a period of ductless gland stability, and the chronic degenerative types occur at a period of ductless gland deterioration. ROBERT V LUTHERTON M.D.

Cecil, R. L.: Rheumatoid Arthritis. A New Method of Approach to this Disease. *J Am M Ass* 1933, c 330

In the last forty years our knowledge of arthritis has been advanced by: (1) recognition of the two great types of chronic joint disease now usually referred to as "rheumatoid arthritis and osteoarthritis," (2) Billings' theory of focal infection, (3) modern bacteriology and serology, (4) studies of the relation of the carbohydrate metabolism and of vitamins to arthritis, (5) new methods in the application of physical therapy, hydrotherapy and climatology, and (6) advances in the surgical and orthopedic treatment of chronic arthritis.

A classification recently adopted lists 6 types of arthritis: infectious (rheumatoid), degenerative (osteo-arthritis, hypertrophic arthritis), allergic, traumatic, metabolic, and neurogenic.

It is important to distinguish between rheumatoid arthritis and osteoarthritis. The former is primarily a disease of the synovial membrane and other soft parts of the joints in which microscopic examination shows peculiar clumps of lymphoid cells and roentgen ray examination discloses, first a hardness of the interarticular space and bone rarefaction, and later cartilage destruction, apposition of the surfaces, and possibly fusion. Osteoarthritis involves the hard tissues of the joint, causing fibrillation and thinning of the cartilage, condensation and eburnation of the bone, and bony apposition and hypertrophy of the articular margins, but no fusion of the surfaces. These differences suggest that the 2 types are distinct entities due to different causes. The granulation tissue in the joint the clinical course, the symptoms, and the laboratory findings indicate that the rheumatoid type is a chronic inflammatory process. Hypertrophic arthritis, or osteoarthritis, appears to be a degenerative lesion which is possibly aggravated by toxic or metabolic factors, but is not due primarily to infection.

In rheumatoid arthritis, focal infection is of great importance. Of 154 cases of this disease reviewed by the author in 1930 streptococci were isolated from the blood in 62 per cent and were found also in the joints in 67 per cent of those in which joint cultures were made. As these organisms will produce the disease when they are injected into rabbits and as the serum of most patients with rheumatoid arthritis contains specific agglutinins for them, there seems sufficient evidence to warrant the conclusion that a causative organism has been discovered.

Several investigators have found that the average sedimentation index is definitely higher in rheumatoid arthritis than in osteoarthritis, and the conclusion has been drawn that any case with joint symptoms and a sedimentation index above 1 may be considered a case of infectious arthritis. If other forms of infection can be eliminated.

Of a small series of cases of arthritis in which Schilling hemograms were made, the rheumatoid groups showed a distinct shift to the left which was not shown by the osteoarthritic group. This constitutes further evidence of an infectious origin of rheumatoid arthritis.

The modern clinical laboratory can aid in the differential diagnosis of arthritis by cultural studies of the blood and joint fluid, agglutination tests of the blood with the streptococcus hemolyticus sedimentation tests and Schilling leucocyte counts. These procedures will prove useful also in determining the response to treatment and the prognosis.

In osteoarthritis, reduction of weight by a low calorie diet, the administration of thyroid extract when the metabolic rate is low, the correction of posture by orthopedic measures, and physical therapy are of value. Vaccine is useless. The removal of foci of infection should be undertaken only to protect the patient's health and not with any hope of curing the degenerative process in the joint.

In rheumatoid arthritis the elimination of foci of infection is the chief therapeutic indication. Physical and mental rest is very important. The diet should have a low carbohydrate and a high vitamin content. Good elimination and a copious water intake are necessary. Heat, exercises and massage are valuable. In cases showing no improvement under treatment by these measures, the hot, dry climate of the Southwest may have a good effect. Streptococcus vaccines administered intravenously are sometimes beneficial. They should be tried for at least a few months and then discontinued if no improvement is noted. The only drugs of value are iron for anemia, arsenic and strychnine as tonics, and salicylates for the relief of pain. When deformities result, orthopedic surgery may be of great benefit.

CHAS. C. GUY, M.D.

Jeanneney G: Seven Cases of Chronic Ankylosing Rheumatism Treated by Parathyroidectomy (Sept cas de rhumatisme chronique ankylois traités par parathyroïdectomie) *Bordeaux chir* 1935 No 2 147

In the first of the seven cases of chronic ankylosing rheumatism reported by the author there was slight improvement after the operation and in three there was marked improvement. One patient died on the twentieth day and one on the twenty-seventh day. In two cases there was considerable improvement and in one there was none.

In the cases in which the parathyroidectomy was beneficial the pain stopped immediately after the operation and there was improvement in function as a result of the relaxation of the protective con-

tracture. However, the disability from the ankylosis was not affected at all or was not affected until late. The swelling of the joints subsided, the trophic skin symptoms were cured, and the blood calcium fell to normal or even below normal. The roentgen appearance of the bones changed little. In one case there was slight recalcification after several months. Leriche estimated that the improvement persists for years or permanently in 52 per cent of the cases.

The author's cases showing improvement were those of painful ankylosing arthritis without a history of infection or gout and with hypercalcaemia. In two cases the parathyroids were not found. In one of the latter the operation was a complete failure but in the other it was followed by marked improvement which was attributed to the ligation of all four thyroid arteries. The failure is explained by the assumption that the condition was probably tuberculous arthritis. One of the deaths was caused by pneumonia but was preceded by signs of hypoparathyroidism. The other was apparently caused by late parathyroid insufficiency. The resistance of persons with chronic ankylosing rheumatism is not very great. The author states that he intends in the future, to perform only unilateral operations.

When there are signs of hypoparathyroidism immediately after the operation, calcium and irradiated ergosterol should be given. Care should be taken in the mobilization of the joints which are no longer painful. If operation is done with care to avoid hypoparathyroidism it promises to be of great value.

AUDREY GOSS MORGAN, M.D.

Dawson M. H. and Boots, R. H. Recent Studies in Rheumatoid (Chronic Infectious, Atrophic) Arthritis. *New England J Med* 1933 cxviii 1030

Rheumatoid or atrophic arthritis must still be considered a disease of unknown causation. However it presents many of the characteristics of an infectious process. There is often a history of an acute infection of the upper respiratory tract such as a common cold, pharyngitis, tonsillitis, tonsillar abscess or sinusitis. A low grade fever accompanied by a slight leucocytosis is a common manifestation of the disease. Frequently the pulse is rapid, and in over 80 per cent of the cases there is deplete anemia. Muscular atrophy occurs to a degree too considerable to be ascribed to mere disuse. The patient almost invariably loses weight and appears chronically ill. All of these clinical features are consistent with infection. Until recently the theory that rheumatoid arthritis is related or due to infection was based on purely clinical findings but in the past few years it has gained considerable support from bacteriological and pathological investigations.

According to some the disease is caused by the growth of the infecting organisms in the tissues affected. According to others it represents a reaction to a focus of infection elsewhere which is of the nature of an allergic phenomenon or a simple toxic reaction to noxious products absorbed from the primary focus.

The authors' findings and conclusions are summarized as follows:

1. Contrary to the results of certain other investigators, streptococci could not be recovered from the blood or tissues of patients suffering from rheumatoid arthritis.

2. At a temperature of 55 degrees C. the serum of patients with rheumatoid arthritis usually possesses the capacity to agglutinate strains of streptococcus hemolyticus to an extraordinarily high titer. This agglutination is a very characteristic phenomenon but further work is required before conclusions can be drawn with regard to its significance.

3. Subcutaneous nodules which show a striking histological resemblance to those occurring in rheumatic fever have been observed in approximately 70 per cent of cases of rheumatoid arthritis.

4. The sedimentation rate of the erythrocytes in rheumatoid arthritis parallels to an extraordinary degree the severity and extent of the arthritic process. The test constitutes a convenient method of evaluating the results of therapeutic measures and is useful as an aid in the differentiation of rheumatoid arthritis from osteo-arthritis.

5. While vaccine therapy may be accorded a trial in the treatment of rheumatoid arthritis, its value has not been determined. In cases of osteo-arthritis there seems to be no justification for the use of vaccines.

6. Pathological and immunological evidence confirms the clinical impression that rheumatoid arthritis is a clinical entity and suggests that the condition is of infectious origin.

H. EARLE CORNWELL, M.D.

Guibal, A. and Montagne, J.: Osteomyelitis of the Scapula (*Osteomyélite de l'omoplate*). *Rev. d'Chir. Par.* 1934, 34, 568.

The authors have recently observed a number of cases of acute infection of the scapula which called their attention to the difficulty of diagnosing osteomyelitis of this bone. This difficulty is due largely to the complex structure of the bone which is of such a nature that infections of different parts of it simulate inflammations of other regions.

The bone has ten centers of ossification and a number of ridges and processes which together with the muscles and aponeuroses, outline a number of fossae and spaces which drain in different directions. There may be multiple foci of osteomyelitis and fistulae from suppuration open at various points. Suprascapular foci spread toward the neck, subscapular foci toward the back, subscapular foci toward the wall of the thorax, anterior foci toward the scapulo-humeral joint, and axillary foci toward the axillary space. When the infection is multifocal the inflammation may invade the whole region.

It is important to know the different localizations in order to suspect osteomyelitis of the scapula when symptoms point to different regions and in order to choose the correct route of approach to the diseased part of the bone.

The topography of the region is described in detail with illustrations, and cases of involvement in the different locations are reported.

AUDREY GORE MORGAN, M.D.

Richard, A., Delahaye, A., and Calvat, J.: Observations Regarding the Clinical Aspects and Treatment of Sacrocoxalitis (*Remarques cliniques et thérapeutiques sur la sacro-coxalgie*). *Rev. d'Orthop.* 1935, 31, 97.

Thirty-six cases of sacrocoxalitis treated by the authors are reported. The case histories are supplemented with roentgenograms. Twenty-six of the patients were adults. The course of the disease is quite different in children and adults. While, in both, the initial lesion is in the bone and the joint becomes involved secondarily in the child the primary osteitis which is generally in the ilium, is at a distance from the joint and for a long time the clinical and roentgen signs are those of a simple osteitis which may be cured before it reaches the joint. Joint involvement is always late. In the adult involvement of the joint is much more rapid. The differences between the joint of the child and adult which are responsible for the variations in the course of the disease are shown by roentgenograms.

When the joint is threatened its defensive forces are mobilized. In the early stages there is a tendency toward spontaneous healing by fibrous ankylosis or synostosis.

In the child the characteristic feature is a long period without functional disturbances during which abscess is the only sign of the osteitis. Later there is painful limping and the roentgenogram shows an old iliac lesion with late invasion of the joint and trophic disturbances. If the osteitis is recognized and treated in time, the joint involvement may be prevented. At first the only signs suggesting osteitis are slight pointitis, deep infiltration of the buttock, slight muscle atony, slight difficulty in walking, and a fever characteristic of tuberculosis or the presence of a focus of tuberculosis elsewhere in the body. Rest in bed and immobilization will often bring about spontaneous retrogression. In some cases curettage of fungoidities or removal of sequestra may be necessary.

In adults there are five signs on which an early diagnosis may be based. Two functional signs are pain in the sacral roots and painful limping. Two roentgen signs are sacro-iliac diastasis and displacement at the symphyseal pubis, the bone on the diseased side being pushed up farther than the bone on the normal side. In addition to these signs there is pain on digital examination of the joint, which is demonstrated best by rectal palpation.

When sacrocoxalitis reaches the stage of abscess formation it is severe. The surgeon should attempt to prevent its reaching this stage.

The present tendency in treatment is to bring about immobilization as early as possible by operative ankylosis. The two methods used are trans-articular and extra-articular arthrodesis by means

of grafts taken from the tibia. In two of the authors cases it was necessary to resect the posterolateral spines of the ilium AUDREY Goss MORGAN M.D.

Borsotti P. C.: The Pathology and Surgery of the Articular Meniscus of the Knee (Patologia e chirurgia del menischi articolari del ginocchio) *Arch ital di chir.*, 1933 xxxiii, 109.

Borsotti reviews the anatomy and physiology of the articular meniscus of the knee joint, reports his observations in 147 cases in which operation was performed for disturbances of these structures, discusses the embryological development of the meniscus from the fiftieth day of intra uterine life to birth, and describes the degenerative changes that occur in the meniscus during life and are found in the cadaver.

In his discussion of the pathology of the meniscus he reports a case of meniscitis, that of a patient thirty years of age with symptoms referable to a lesion of the internal meniscus. At operation, the meniscus was found thickened, swollen, and definitely inflamed. The synovial membrane was also inflamed. Excision of the meniscus was done. Examination of the excised specimen revealed no signs of fracture. Histological examination disclosed evidence of chronic inflammation in the capsule and the outer third of the meniscus. It was difficult to determine whether the inflammation of the meniscus was primary or secondary to inflammatory processes elsewhere in the joint. However the patient was relieved of symptoms following the removal of the meniscus.

In an experimental study of the reaction of the meniscus to staphylococcus infection of the joint Borsotti found that the meniscus become involved in the inflammation early and undergo extensive degeneration.

In order to determine the reaction of the semilunar meniscus to general infections, Borsotti made a postmortem study of the meniscus of persons dying from acute infections. His observations indicate that the meniscus do not participate to any degree in the general infectious process. However in a case of osteomalacia he removed a meniscus that consisted solely of dense fibrous connective tissue.

The histological changes found in meniscus removed by operation usually consisted of the combination of a degenerative and an inflammatory process. In the meniscus which were dislocated but not fractured there were practically no structural alterations, whereas of 103 fractured menisci 90 showed definite histological changes. One specimen presented evidence of spontaneous repair. The author believes that spontaneous repair is uncommon as the fractured fragments must remain together and this is almost impossible in the knee.

Regeneration of the meniscus was studied experimentally in rabbits. No regeneration of cartilage was noted but hypertrophy of connective tissue at the site of excision was common.

The relation of the lesions of the menisci to arthritis deformans is discussed. Destruction of the

meniscus may occur in this joint disease and the author believes that repeated neglected injuries of the meniscus may predispose to arthritis deformans. Removal of the meniscus arrests the course of the arthritis. Meniscectomy does not predispose to arthritis deformans.

The author reviews traumatic lesions of the meniscus and discusses their development pathology symptoms, and diagnosis. The article contains several roentgenograms taken after the injection of oxygen into the knee joint to outline the fractured meniscus. Borsotti finds this method of considerable diagnostic value. He describes the technique of the injection in detail. He has noted no unfavorable effects from the procedure.

Treatment of the injured meniscus consists of early surgical removal to prevent inflammatory and arthritic changes. Donati's method of approach to the joint through a transverse slightly curved incision 7 or 8 cm. long is described. This incision begins at the margin of the patellar ligament curves downward and posteriorly so as to cross the inter articular line at its lowermost portion and ends about 0.8 cm. above the interarticular line posteriorly. The capsule is incised transversely. The collateral ligament need not be incised unless more exposure is necessary.

After the operation mobilization is begun at about the fourth or fifth day and is accompanied by massage of the quadriceps group of muscles.

Borsotti reports a case in which a synovial cyst was found in a fractured meniscus. He discusses the theories concerning the causation and reviews the symptoms and surgical treatment of such cysts.

PETER A. ROSE, M.D.

Speed J. S. and Blake T. H.: March Foot. *J Bone & Joint Surg* 1933 xv 372

March foot is a clinical entity characterized by painful swelling of the forefoot. It was first described in 1855. Since then little has been added to our knowledge regarding it except that it is often associated with a spontaneous fracture of one of the metatarsal bones. There is seldom a history of direct trauma, but practically all patients with the condition report excessive foot strain. German and French surgeons have reported many cases in soldiers after long forced marches hence the name.

The pain is at first indefinite and associated with tenderness over the second or third metatarsal bones anteriorly. It is followed by an ordematous swelling of the dorsum of the foot with local redness and heat. The condition is benefited by rest but recurs with use of the foot. In the later stages a firm tumor like mass can be felt attached to the bone.

Clinically two types of the condition are recognized a mild type in which the disability lasts from one to two weeks and is not associated with roentgenographic evidence of a bone lesion, and a more severe type in which the disability lasts for from two to three months and is associated with periosteal proliferation spontaneous fracture and ex

callus formation. The fracture line may escape detection as it may be obscured by callus or may be so fine that a good roentgenogram and a magnifying glass are required for its visualization.

The incidence of fracture is reported by different surgeons at from 30 to 90 per cent. Its variation is explained by the fact that civilians usually seek medical attention only when the condition is severe and by the fact that when roentgenograms are made the fracture line is often overlooked. The fracture is practically always limited to one metatarsal. Displacement of fragments is unusual.

The progress of the bone lesion was followed in several cases by a series of roentgenograms. From one to three weeks after the onset of symptoms periosteal fuzidions appear with or without a fracture line. Later there is an excess of callus and a fracture with an irregular outline is seen distinctly. The callus then becomes denser and a spindle shaped mass which may be taken for a sarcoma is observed. Healing then occurs, and six months later the bone appears normal except for slight residual thickening of the cortex.

The cause of the condition is still unknown, but is undoubtedly associated with foot strain. Foot strain may weaken muscles and relax ligaments, thereby exposing the metatarsals to unusual tension and trauma. A disturbance of function of the anterior metatarsal arch seems probable but it is not known whether this produces the fracture by trauma or by altering the nutrition of the bone by causing a circulatory disturbance.

The treatment of march foot should include rest, hot applications, and relief from weight bearing. Physical therapy and exercises are also beneficial. When walking is resumed, a proper arch support or strapping is advisable. When fracture has occurred the average period of disability is from four to eight weeks. The prognosis for ultimate recovery is always good.

The authors briefly review nine cases. Several of the case histories are supplemented by roentgenograms.

CRESTER C. GOV. M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Haldeman, K. O.: The Influence of Periosteum on the Survival of Bone Grafts. *J. B. & J. Int. Surg.* 933, xv, 302.

The controversy regarding the mode of repair of bone had, as its natural sequel, the dispute as to the survival and growth of the various types of grafts. Since Duhamel first advanced the periosteal theory of bone repair two hundred years ago, this theory has had many ardent supporters. Best known of the latter was Ollier. Equally confident, though fewer in number have been the proponents of the theory that bone is formed by the cells of the cortex. According to a third theory which has gained ground in recent years, the new bone following a fracture is formed extracellularly by the deposition of calcium

salts in an edematous embryonic type of connective tissue.

Whether or not a bone graft continues to live and the parts played by its various components in its survival are of great importance in the surgery of bones. Ollier believed that a piece of living periosteum-covered bone continues to live and grow after its transplantation to a bony bed. Barth, in 1894, maintained that all parts of a transplanted bone die and are replaced by a new growth of bone from the site in which the transplant is placed. During the following decade Barth's theory that all varieties of bone material are equally successful was generally accepted and surgeons turned from the use of living bone grafts to the implantation of dead bone. However the clinical results during that decade demonstrated the superiority of living grafts.

Recently Phemister and others have shown that the dead portions of a graft are formed into living bone by the process of creeping substitution in which the periosteum, endosteum and cells of the Haversian canals of the graft play a part.

The experiments reported by the author were carried out to determine the fate of the different types of bone grafts under conditions resembling those found clinically in the hope that conclusions might be drawn regarding the relative importance of periosteum, cortex and endosteum in the success of grafting.

Bone-grafting operations were performed on twenty two rabbits between four and eight months old. A defect was produced in each radius and the gap bridged by a graft taken from the tibia or fibula of the same rabbit. The ends of the graft were fixed in the open ends of the radius as an intramedullary graft. As two bone-grafting operations were performed on each rabbit it was possible to compare the various types of transplants under the same conditions. Anesthesia was induced by the intraperitoneal injection of 0.060 gm. of sodium amylal per kilogram of body weight. The operations were performed with an aseptic technique and were followed by normal healing without infection. No splints were necessary as the intact ulna prevented undue movement. After the operation, roentgenograms of both forelegs were made at weekly intervals until the fate of the grafts became apparent. The animal was then killed and the radius and graft were studied microscopically. In certain cases the animals were sacrificed after three or four weeks to determine the earlier changes occurring around the grafts.

It was found that a graft composed of the entire fibula survived longer and favored earlier closure of the defect than a graft of fibula without periosteum or a split fibula. A periosteal graft free from bone produced early closure of the defect in every case. The osteoperiosteal graft also resulted in early closure of the defect, apparently through the activity of the periosteum rather than the fine pieces of cortex included in the graft. A comparison of cortical grafts with and without periosteum showed

clearly that the presence of periosteum on a graft favored early closure of the defect and survival of the graft. The author draws the following conclusions:

1. Periosteum is the most important part of a bone graft as regards both union of the fractured bone and survival of the graft.

2. In the absence of periosteum on the graft, union of the fracture is delayed or fails to occur and the graft dies and is finally absorbed.

3. The bone cells of a graft die within a few days. The framework of the graft may then be revitalized by living cells spreading outward from enlarged haversian canals, a process which may be called creeping substitution. H. EARLE CONWELL, M.D.

Salmon M. and Contiades A. J.: The Surgical Treatment of Spondylolisthesis (*Traitement chirurgical du spondylolisthésis*). *Rev. L'Orthop.*, 1933 xl 193

A case of spondylolisthesis in a sixteen year-old girl is reported. When the patient was first seen, the deformity was of two months duration. It had appeared without apparent cause. The patient complained of pain localized in the lower lumbar and sacral region. Operation consisted of exposure of the sacrum and the third, fourth, and fifth lumbar vertebrae and the introduction of a thick osteoplastic graft on both sides of the spinous processes. After the operation a body cast was applied and immobilization was maintained for two months. The immediate results were excellent and three years later the patient remained functionally cured.

Twenty five cases of spondylolisthesis treated surgically are reviewed from the literature.

The essential lesion appears to be faulty development of the vertebral pedicles. There is a gap in the bone filled by fibrous tissue which in stretching allows the body of the vertebra to slip forward on the sacrum. The arch remains approximately in its normal position. Because of these facts, surgical treatment by the introduction of a graft or other means of fixation was for a long time regarded as useless. However if the fixation includes the lower three lumbar vertebrae, it is beneficial. One of the most important functions of the graft is to re-establish the normal statics of the pelvis by carrying the weight of the vertebral column more posteriorly with respect to the sacrum.

The operations of Hibbs, Albee, and Campbell are described. The authors prefer the more simple operation performed in the case they report.

ALBERT F. DE GROAT, M.D.

Bankart A. S. B.: The Treatment of Tuberculous Disease of the Hip Joint. *Brit. J. Surg.* 1933 xx 551

Bankart states that it is misleading to speak of joint tuberculosis as a local manifestation of general tuberculosis. The joint condition should be considered rather a metastatic infection due to the accidental detachment of a minute tuberculous embolus, an accident which is not likely to be re-

peated often as is evidenced by the rarity of multiple joint tuberculosis. Tuberculosis of the hip or knee is as much a local disease as the primary focus.

A small tuberculous lesion may produce general immunity of the body by the elaboration of small doses of tuberculin but a large lesion producing excessive amounts of tuberculin may reduce the immunity. It would therefore seem that when possible a large area of tuberculous infection should be removed in order to diminish the amount of tuberculous toxin absorbed by the body and thereby produce a beneficial effect on other and more remote foci of the disease.

Twenty five years ago conservative treatment of hip tuberculosis was favored but today the tendency is toward more radical treatment and some surgeons are doing arthrodesis in practically all cases. It remains to be determined whether abolition of movement in the hip joint will cure tuberculous disease of the pelvis.

Pugh has observed that the disease commonly begins in the inner portion of the ilium, immediately above the acetabulum and spreads from there to the head of the femur and the hip joint through the ligamentum teres. Although the symptoms of joint disease dominate the clinical picture the primary disease is in the pelvis. Modern extra-articular fusion operations do nothing to remove the disease in the acetabulum.

Tuberculous destruction of bone results in the formation of a cavity filled by soft tuberculous material, and spontaneous cure results only when the cavity is collapsed, the soft material is squeezed out and solid bone comes into contact with solid bone. This is well demonstrated in spinal caries, in which complete and permanent healing results when a solid deformity has occurred. Anything which prevents obliteration of the cavity leads to the production of a chronic tuberculous cavity and although this may be encapsulated and quiescent for years it remains a constant menace to health.

Thirty years ago Lorenz maintained that ankylosis with sound healing was the best result obtainable in tuberculosis of the hip. His treatment consisted essentially in allowing weight bearing with an immobilizing plaster spica. He treated abscesses by aspiration and deformities by subtrochanteric osteotomy. His weight-bearing treatment tended to force the head of the femur into the acetabulum and obliterate the cavity formed by the destruction of bone. Theoretically an extra articular arthrodesis done before the cavity is obliterated would tend to prevent healing provided the fusion is firm enough to prevent ascent of the femur. In practice however operation is usually done late after cavity obliteration has already occurred and after the operation weight bearing is allowed before the artificial fusion is strong enough to prevent ascent of the femur. Bankart therefore asks whether extra articular arthrodesis for tuberculosis of the hip is not essentially the same treatment as that advocated by Lorenz thirty years ago.

Bankart does not believe that an ankylosed hip is the best result to be hoped for. He reports nine cases in which the dominant feature was pelvic disease, quiescent but uncured for years, and suggests that this is the common, if not the usual, result of conservative treatment. In all of these cases the tuberculous acetabulum and upper end of the femur were excised, the end of the femoral shaft was implanted on the cut surface of the ilium, a plaster spica was applied, and weight bearing was allowed after from five to eight weeks. All of the wounds healed by primary intention except one in which there was a secondary infection. All of the patients have stable hips, and all except one who later developed a sinus and complete ankylosis, have some useful motion.

In conclusion Bankart suggests that early excision of the focus in the ilium may be considered a rational method of treatment since, according to his experience, it may result in earlier cure with preservation of some useful motion. As the operation is a severe one, a blood transfusion at the same time is essential. Bankart reports two deaths, both those of children. One was due to hemorrhage and the other to pulmonary embolism. *Cecilia C. Gray, M.D.*

Odasso, A.: Astragalectomy. Indications and Results. Indicazione ed esiti dell'astragalectomia. Arch. ital. di chir., 1933, xxxiii, 597.

Following a detailed discussion of the anatomy and function of the astragalus, the mechanics of normal gait, the form and functional possibilities of the foot after astragalectomy, the indications for the operation, the operative technique, and the after care, the author gives the histories of twelve cases followed for periods up to eight years after operation. In seven of these cases the operation was done for tuberculosis in one case each, for fracture and dislocation of the astragalus in two cases, for deformities following poliomyelitis and in one case for painful flat foot. All the results may be regarded as excellent if the seriousness of the condition is taken into consideration. The foot was only slightly deformed and retained well its functions in standing and walking.

Odasso concludes that astragalectomy is most clearly indicated in the following conditions:

1. Fracture. Astragalectomy is indicated in cases of fracture because, even in the absence of displacement, fractures involving the articular surfaces are usually followed by poor functional results on account of the characteristic lack of consolidation and the development of periarthritis. Although successful results from simple bandaging or operative reduction in exceptional cases are being reported in increasing numbers, the majority of surgeons advise early and total astragalectomy because of the unsatisfactory late results of these procedures. While its results are less brilliant in cases of old, poorly healed fractures and those complicated by arthritis, astragalectomy alone may improve the sequelae.

2. Dislocation which is irreducible, habitual, or accompanied by wounds or fracture.

3. Osteomyelitis of the astragalus or purulent arthritis of the tarsus.

4. Tuberculosis of the astragalus or tibiotarsal tuberculosis in persons over twenty years of age if expectant methods prove ineffective. With regard to the cases of children and adolescents, the advisability of operation is still under discussion. Even in the young, there are forms of bone tuberculosis which are curable by medical treatment alone. When, in children over six years of age, suppuration is persistent and the process is progressive, astragalectomy is definitely indicated. The full advantages of the operation will be realized only if it is performed early while the lesion is limited to an osteitis of the astragalus or a tibiotarsal osteo-arthritis. The anatomical and functional results are in general superior to those obtained by non-operative methods.

In painful flat-foot with complete deviation which is refractory to the usual orthopedic measures, astragalectomy is logical although its indication is not absolute. The deformity is osteo-articular and can be radically cured only by intervention involving the bones and articulations. In cases of marked deformity of the astragalus the results are very good although not always equal to those of cuneiform osteotomy in cases in which the astragalus is only slightly altered.

In paralysis of the foot following poliomyelitis, astragalectomy is indicated only exceptionally but in certain cases, when combined with tibiotarsal fixation, it may correct severe and otherwise irreducible deformities. In general, however, extra-articular operations (tenodesis and arthrodesis) are the procedures of choice.

Patient and methodical after-care is of the utmost importance to prevent deviations of the foot and obtain as far as possible a satisfactory nearthrosis and definite success in every case.

The author includes in his article numerous roentgenograms and photographs showing his results, discusses the recent literature (particularly the Italian and French) and appends an extensive bibliography. *MARY ELIZABETH MORSE, M.D.*

FRACTURES AND DISLOCATIONS

Gurd, F. B.: The Treatment of Compound Fractures. A Specific Technique for the Prevention and Control of Osteomyelitis. J. Bone & Joint Surg. 1933, xv, 337.

For the treatment of severe compound fractures with extensive lacerations and contamination of tissue, a specific technique is recommended by the author. The essential features of this technique are:

1. Immediate operation and reduction of the fracture *secondum artem*.

2. Conservative excision and radical inclusion of tissues.

3. Proper "blipping" of the wound following debridement.

4. Obliteration of dead spaces and the prevention of adhesion of opposing wound surfaces by means of

firm packing with relatively large paraffin-soaked, 'bipped' packs.

5 All possible avoidance of ligatures and sutures.

6 The application of plaster of Paris over a thin layer of padding without the cutting of a window

7 Infrequent dressings the first about eighteen days after the injury done in the operating room under anesthesia, secondary suture and packing

8 As soon as union begins the application of an unpadded plaster and felt heel.

H. EARLE CONWELL, M.D.

Stewart, W. J.: Aseptic Necrosis of the Head of the Femur Following Traumatic Dislocation of the Hip Joint. Case Report and Experimental Studies. *J. Bone & Joint Surg.* 1935 xv 413

A healthy twenty-two-year-old man suffered a simple traumatic dislocation of the hip. The dislocation was reduced within a few hours and a plaster spica cast applied for six weeks. The dislocation and its satisfactory reduction were shown by roentgenograms. The roentgenograms revealed no abnormality of the femoral head. Walking was permitted on removal of the cast but after five months the pain and stiffness began to increase. Nine and a half months after the dislocation roentgenograms revealed beginning disappearance of the cartilage space and flattening of the head of the femur. The bone changes increased and one year after the accident led to a diagnosis of aseptic necrosis of the head of the femur with ossification of the capsule and destructive traumatic arthritis of the acetabulum. The patient was placed in a cast for two months and at the end of that time was treated by traction for two hours daily for three weeks. Walking with crutches was then permitted. When the last roentgen ray examination was made, about seventeen months after the beginning of treatment, the head of the femur was seen to be becoming rounder, smoother, and denser.

The necrosis was thought to be due to a disturbance in the circulation through the vessels of the ligamentum teres or those of the capsule or both. In an attempt to reproduce the lesion in animals six series of experiments were carried out on young and adult rabbits and adult dogs. Two series of experiments were made on each group. In the first group the ligamentum teres alone was cut through. In the second this ligament and the periosteum of the neck of the femur were both divided. The animals were then killed and the femora examined with the roentgen rays and sectioned after intervals of from forty-five to one hundred and twenty days.

In some of the experiments part of the femoral heads died, but there was no regularity in the changes and in no case was collapse of the head produced. Apparently there was a sufficient blood supply in the neck to prevent necrosis of the head. The ligamentum teres showed a distinct tendency to reunite. Changes similar to those of Legg-Calvé-Perthes disease were not produced in the younger animals with open epiphyseal lines.

The author believes that the case he reports in this article is the only one on record in which aseptic necrosis of the femoral head followed traumatic dislocation. He states that the arthritis was secondary to the necrosis and that weight-bearing should be avoided when roentgenograms reveal aseptic necrosis and breaking down of the head, whatever the cause.

CHESTER C. GUY, M.D.

Basset, A.: Late Partial Absorption of the Head of the Femur After Screw Fixation Without Arthrotomy for Fracture of the Neck of the Femur (Résorption partielle tardive de la tête du fémur après vissage sans arthrotomie pour fracture transcrurale du col). *Rev. d'arthop.* 1932 xxxix 589

A woman of sixty-two years was operated on ten days after fracture of the neck of the femur. Reduction was accomplished and a beef bone screw introduced. A good anatomical and functional result was obtained. Three years later following an attack of angina with fever pain radiating down the thigh began in the hip and groin. There were no objective clinical findings but roentgen ray examination showed partial absorption of the bone screw flattening of the upper weight-bearing surface of the head of the femur, an irregular outline above and anterior and decalcification around the bone screw.

In a review of the literature the author found the reports of a few similar cases. In one case the hip was opened up two years after the fracture, a free sequestrum and narrowing of the cartilage were found and the condition was diagnosed as osteochondritis dissecans. In another case pain and deformity of the head of the femur began two years after an operation in which bone pegging was done for fracture of the neck of the femur. The upper surface of the head of the femur was shown by roentgen examination to be separated from the main part. On its removal by operation it was found to be necrotic and to consist of cartilage and bone. This condition occurs in cases which have had bony union and a return of weight bearing function, usually cases with internal fixation by means of a bone screw or peg. Most observers are agreed that the process is one of necrosis. As it is possible that the necrosis results from impairment of the circulation of the head of the femur care should be taken not to introduce the bone peg or screw beyond the center of the head lest it cause destruction of arteries.

The treatment should consist of immobilization. Weight bearing should be prohibited. The disease seems to be self limited. Its symptoms cease with rest but the deformity in the head of the bone of course persists. WILLIAM ARTHUR CLARK, M.D.

Mano, N.D. The Treatment of Fractures of the Leg by New Methods (Il trattamento delle fratture di gamba con nuovi metodi). *Chir. di organi di movimento* 1932 xvii 413

The author reviews briefly some of the recent modifications in the treatment of fractures of the

Pineilli L.: A Clinical Contribution to the Study of the So-Called "Spontaneous" or "Effort" Thrombophlebitis (Contributo clinico allo studio della tromboflebite detta "spontanea" o "da sforzo") *Cli d'urto e di movimento* 933 xvii 537

The author reports a case of spontaneous or effort thrombophlebitis in a man of forty six years who was a bell ringer. One day after ringing the bells, the patient experienced sudden pain and a feeling of heaviness in his right arm which was accompanied by edema and cyanosis. His general health was and remained excellent.

The reports of thirty-five similar cases collected from the literature are abstracted by the author. By some the thrombi are attributed to mild infection, but Pineilli believes they are aseptic thrombi caused by injury to the venous endothelium by muscle contraction. He states that the small veins may be torn away at the mouths where they empty into the larger ones. His theory is based on the following facts:

1. The thrombi are more frequent in the arms than in the legs.
2. They are more common in the right than in the left arm.
3. They generally occur in young and robust persons.
4. Unlike infectious thrombi they rarely cause emboli.

Pineilli's patient had a supernumerary rib on both sides. The rib on the right side was more developed than the rib on the left side. Pineilli believes that pressure from the supernumerary rib

may have been a factor in the pathogenesis of the thrombophlebitis.

In the treatment, immobilization and elevation of the limb are generally sufficient. Good results have been obtained also from thermotherapy, compression by elastic bandages, electrotherapy and ultraviolet radiation. Audrey Goss Morgan M.D.

Grieco F.: Clinical and Histological Notes on Two Cases of Buerger's Syndrome (Note cliniche ed anatomo-istologiche su due casi di sindrome di L. Boerger) *Arch. Ital. di Med.* 1933 xviii, 289.

The author reports two cases presenting Buerger's syndrome in which conservative treatment such as stretching of the nerves and periaarterial sympathectomy failed to effect a cure and a mutilating operation was necessary. Even suprarenalectomy has not proved as successful in this condition as was hoped. The histological findings in the cases reported, both of which were treated by Cantelmo, are described in detail. In the first case Cantelmo found that the primary lesion was not a thromboangitis, but an endarteritis, the change in the vessel wall being primary and the thrombosis secondary. From this he concluded that Buerger's disease is not a uniform disease but a syndrome that may present different histological lesions and may be brought about by different causes.

Grieco agrees with this conclusion because although the clinical picture was the same in the two cases he reports, one of the cases showed a primary endarteritis and the other a primary thromboangitis.

Audrey Goss Morgan M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Passot, R.: Aesthetic Treatment of Keloids. Surgical Removal Followed by Immediate Irradiation (Traitement esthétique des chéloïdes, ablation chirurgicale suivie d'irradiation immédiate) *Presse méd.* Par 1933 27, 544.

Passot emphasizes that successful treatment of keloids depends upon immediate irradiation after surgical removal. In 1932 he recommended the use of radium about a week after operation, but he now strongly advises it immediately after operation.

In the removal of a keloid it must be kept in mind that the subcutaneous involvement is usually much greater in extent than the surface involvement. Great care must be taken to remove every particle of the keloid because the smallest remaining portion will give rise to recurrence. If the defect left is too large for simple suture a graft of fat taken from the thigh may be implanted. In depressed cicatrices fat grafts are very successful. In a keloid scar they have a tendency to produce irritation and thereby favor renewed keloid formation. This tendency can be successfully combated by the immediate application of radium. The irregular margins of the keloid scar should be cut to a simple elliptical pattern. When possible the natural folds of the skin should be followed. Two types of sutures have been recommended the dermo-epidermic and the intradermic. The former is an interrupted suture in which each stitch is placed obliquely from within outward and the needle takes in a greater thickness of cutaneous and subcutaneous tissue below the surface than at the surface. The intradermic suture is an overcasting stitch with free ends at either extremity of the wound. This can be used only in locations where the skin has great resistance. Occasionally Passot employs a double intradermic suture. The dermo-epidermic suture is preferable after the removal of a keloid.

The dressing of the wound is of great importance. To prevent tension on the sutures two methods are suggested. In one method the assistant places his fingers on either side of the wound to form a fold by pressure a layer of cellophane is applied over the fold and the margins of the cellophane are sealed with collodion. Traction then affects the cellophane and not the sutures. In the other method adhesive tape is placed across the incision, cut in the middle and sutured. Traction is then exerted on the tape sutures and not the wound sutures.

Keloids evidently develop between the twelfth and twentieth days after operation, but the pre-keloid stage may be observed as early as the sixth

day. Radium irradiation on the sixth day after removal of the sutures is too late. It should be applied on the same day as the operation if possible even at the same time. According to the size of the incision the author uses one or several tubes of radium. Each tube contains 10 mgm of radium element. The filter is 5 mm. of platinum and the distance of the tube from the skin is 1 cm. When only one tube is used it is left in place for twenty-four hours. When several tubes are employed they are left in place for from fifteen to twenty hours.

Of twenty two cases treated in the manner described a recurrence developed in only one. After a keloid has been removed by operation a preventive dose of radium is sufficient. If radium is used alone to destroy the keloid a disfiguring depigmentation often results as the susceptibility of the patient to irradiation is not easy to determine. Surgical removal of the keloid produces only a regular linear scar.

Beurmann Nour and Gougerot have recommended the early postoperative application of small repeated doses of roentgen irradiation in cases of keloid. Passot has obtained good results from large doses of roentgen irradiation given at one sitting shortly after operation and believes this method preferable to the use of small doses. However, after three recent failures he agrees with Cottenot that radium irradiation is superior to roentgen irradiation.

Ernst S. Moore.

Davanzo I.: Postoperative Bacteremia (Sulla batteriemia postoperatoria) *Riforma med.* 1933 21, 435

Investigations have shown that normal persons may develop a transient bacteremia (entrance into the general circulation of a limited number of bacteria which do not multiply there) without exhibiting any outward manifestations of illness. The incidence of bacteremia after operation has been reported as high as 17 per cent.

Davanzo reports a study of ninety five cases. In sixty five, the condition followed an aseptic laparotomy. In seven, it was associated with serious symptoms of sepsis, including a septic temperature and course. The blood was taken at varying intervals after the operation, generally as soon as possible and always within eight hours. In two of the cases of 'aseptic' laparotomy a staphylococcal bacteremia was present. One of these was a case of old pelvic cellulitis, and the other a case of apparently cured suppurative salpingitis. In the latter the condition ran a septic course and was fatal.

No positive results were obtained in the definitely septic cases. The low morbidity, which was much lower than that reported by others is difficult to

explain, but possibly may be accounted for by the fact that the specimens were not taken immediately after the operation. It has been shown that the number of positive results diminishes greatly four hours after operation.

Morbidity is determined to a marked degree by the site of the operation. The incidence of post-operative bacteremia is highest after operations on structures with an abundant vascular and lymphatic supply such as bone and muscle, because in such structures bacteria have the most favorable opportunity to enter the blood stream. The peritoneum early forms a wall of fibrin which is an almost insurmountable barrier to the entrance of bacteria into the circulating blood. This is true particularly in collections of pus in the pelvis.

Postoperative bacteremia has no constant diagnostic or prognostic value, but in certain cases may be a precursory sign of a septic postoperative course.

JOHN W. ELLIOT, M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

McIver M. A.: A Study in Extensive Cutaneous Burns. *Ann. Surg.* 1933 XLVII, 670.

This article is based on sixteen cases of extensive cutaneous burns of the body and extremities. In five cases the burns proved fatal.

The study of these cases included erythrocyte and leucocyte counts, hematocrit readings, determinations of the sedimentation rate, chemical studies of the blood, including the plasma chlorides, non-protein nitrogen, serum protein, sugar, carbon-dioxide combining power, calcium, and phosphates; chemical studies of the blister fluid; and determinations of the intake and output of fluids.

The findings, which are summarized in eight tables, showed an increase in the white and red cell counts, an increase in the percentage of red cells in proportion to the plasma, and a decrease in the sedimentation rate of the red cells. The blood-chloride values were essentially normal (in the serious cases large amounts of normal salt solution were given). Only two cases showed a very striking increase in the non-protein nitrogen of the blood. These were fatal cases, and the increase was most marked in the terminal stage. In some of the cases there was a decrease in the total plasma protein. When the blood sugar was determined soon after the burns occurred it was usually high. The carbon dioxide values were essentially normal early in the condition, but two of the patients later developed a definite acidosis.

The composition of the blister fluid closely resembled that of the blood plasma.

The urinary output was low and the excretion of the chlorides diminished. These findings were most marked in the more severe cases.

One of the chief findings in cases of severe burns is marked concentration of the blood. Correction of this abnormality by an adequate fluid intake is fre-

quently unable to relieve all of the symptoms or prevent a fatal outcome. Accordingly, it seems probable that some other important factor besides concentration of the blood is involved in the toxemia of burns.

CARL R. STEINER, M.D.

Davis, J. B. and Kitlowaki E. A.: The Treatment of Old Unhealed Burns. *Ann. Surg.* 1933 XLVII, 648.

The authors discuss only the problem of the healing of granulating areas and not the relief of scar contractions in burns from months to years old.

They report the results of treatment of three children and three adults. The children were burned by having their clothes catch on fire, and the adults by gasoline or oil explosions. All of the children and one adult were given transfusions.

Various types of skin grafts are discussed and the details of the treatment are described.

The physical and mental condition of persons with old unhealed burns is usually very poor and must be improved before skin grafting can be successful.

The unhealed area should be grafted as soon as the granulations are in suitable condition, and healing should be induced as quickly as possible. The authors have found the small deep graft most satisfactory as it can be obtained from comparatively small areas some of which could not be used as the source of larger grafts.

In cases of old burns subsequent operative work for the release of scar contractions is almost always necessary. During the treatment of burns scar contraction must be combated by the use of suitable traction apparatus in order to reduce permanent deformity to the minimum. The operative relief of scar contractions, which often occur in even the most carefully treated cases, should not be attempted for at least six months after healing is complete, which is about the time required for the scars to become loosened and softened by massage and passive motion.

CARL R. STEINER, M.D.

Alison J. B.: An Evaluation of the Tannic Acid Treatment of Burns. *Ann. Surg.* 1933 XLVII, 641.

Alison reviews two series of cases of burns treated at the Presbyterian Hospital, Philadelphia. The first series consisted of ninety-one cases treated by many methods during the period from January 1, 1932 to November 17, 1935 and the second, of ninety-seven cases treated with tannic acid during the period from November 17, 1935 to December 31, 1935.

The total mortality in the first series was 28.5 per cent, and that in the second series, 13.3 per cent. The mortality of adults was 27.4 per cent in the first series and 17.3 per cent in the second series, and the mortality of children 39.5 per cent in the first series and 9.3 per cent in the second. Many of the deaths of adults were due to industrial accidents.

In the first series, 65.4 per cent of the deaths occurred within forty-eight hours, and 34.6 per cent in the period of sepsis, whereas in the second series,

84.6 per cent occurred in the first forty-eight hours and 15.4 per cent during the period of infection.

The morbidity and hospitalization are discussed on the basis of two groups of patients with burns involving 50 per cent or more of the body surface. The eleven patients in the first group were hospitalized for an average of sixty-one and seven-tenths days whereas the nineteen patients in the second group, who were treated with tannic acid, were hospitalized for an average of fifty three and a half days. The patients treated with tannic acid therefore remained in the hospital an average of eight and two-tenths days less than those treated by other methods.

CARL R. STEINKE, M D

Raiga, A.: Treatment of Furuncles and Carbuncles of the Face by Bacteriophage (Traitement des furoncles et anthrax de la face par le bactériophage)
Bull et mém Soc d chirurgiens de Par 1933
xxvi 571

Attention is called to the gravity of face infection, especially above the mouth. The danger is due chiefly to the anatomical arrangement of the veins. Raiga reviews 352 cases of furuncles and carbuncles of the face which came under his observation. He defines a furuncle as a circumscribed cutaneous inflammation due most often to the staphylococcus, which begins in the pilosebaceous apparatus, provoking suppuration and slough of this structure and a part of the surrounding dermis so that it is cast off as a yellowish mass. A carbuncle he describes as an inflammatory swelling formed by an agglomeration of furuncles and resting upon a phlegmonous slough.

Of the 352 reviewed cases, the condition was diffuse in 63 (18 per cent). In Raiga's opinion the differentiation between diffuse and circumscribed lesions is extremely important for the prognosis.

Of the lesions of the upper lip in the reviewed cases 43 per cent and of those of the lower lip 50 per cent were of the diffuse type. In the other regions the diffuse form was much less common. Raiga believes that the spread of the infection in the lips is due less to the blood vessel arrangement than to the musculature. The infection travels along the muscles and the movements of the muscles favor its spread. The lesions might very well be called acute myositis, and it is probable that the large veins in the muscles rather than the vessels under the skin become infected. In almost all of the cases of diffuse infection there is a history of more or less violent manipulation such as pressing, squeezing or pricking with a needle or pin. By any of these manipulations a simple furuncle which is perfectly benign may become transformed into a very deep severe lesion. The prognosis suddenly changes and the patient may be responsible for his own death. The author has seen sudden changes take place from an incision made too early even with the thermocauter.

Raiga treated his 352 cases of infection exclusively with bacteriophage. He used a stock phage made by combining several different phages which was

given him by the d Herelle laboratory. He propagated the bacteriophage on a strain of staphylococcus furnished by Gratia, and it was only very rarely that this phage was incapable of affecting the bacteria found in his cases. He believes that the bacteriophage is a living corpuscle and a filterable virus which produces a fatal disease on the bacteria it attacks. The lysis of bacteria in a test tube requires (1) a susceptible strain of bacteria (2) a virulent bacteriophage, and (3) a medium favorable from the physical and chemical standpoints. In the patient, the problem is somewhat different because of the possibility of an unfavorable environment due particularly to the presence of antiphage in the patient's serum. Therefore tests should always be made to determine the presence of this antagonistic substance.

The action of antiphage may be offset by auto-hemotherapy. If the serum of the patient presents an antiphage the patient must be given an intramuscular injection of his own blood. It must be remembered that bacteriophage can act only on the organisms causing the infection. It has absolutely no effect on the tissue which has been destroyed. The latter must be removed in the usual way by absorption or liberation at the proper time.

Raiga emphasizes that when bacteriophage is used chemotherapy should not be given as it may interfere with the action of the phage. Vaccines should be used only if the infecting organism is resistant in the bacteriophage.

Raiga's technique for the use of bacteriophage is as follows:

A culture is made from the lesion and tested for susceptibility to the phage and the serum is studied for the presence of antiphage. Phage is injected directly into the lesion. If septicemia is present the phage is injected also intravenously. When the infection is in the bladder it is inoculated in the bladder. If the gastro intestinal tract is the site of infection, it is given by mouth. In lesions of the face the injection is made into the lesion through a blunt cannula or needle. No attempt is made to inject the periphery as this is painful, dangerous, and unnecessary. Subcutaneous injection at a site distant from the lesion is not advisable because an antilytic substance of another sort may develop rendering the patient more susceptible and auto-hemotherapy does not affect this kind of antibody. However in the presence of a positive blood culture or a threatened positive blood culture, bacteriophage is always injected intravenously when the lesion is a diffuse carbuncle.

In the 352 reviewed cases of furuncles and carbuncles of the face there were only 3 deaths. The fatal cases are reported in some detail. One of them was that of a diabetic woman with a carbuncle involving the inside and outside of the nose and the upper lip. The patient did not respond to local and intravenous injections or auto-hemotherapy. The second death was that of a girl fourteen years of age who had a diffuse carbuncle of the upper lip which

spread downward toward the neck, septicaemia, endocarditis, and osteomyelitis of the sternum and humerus. The local lesion responded strikingly to the phage, but the septicaemia could not be controlled. The third death was that of a woman of thirty-two years who had a diffuse process in both the upper and the lower lip. The upper lip where it started, had been incised through the mucous membrane with the cautery. The infection then spread to the lower lip. The patient was *in extremis* when she was seen by Raiga, and without any expectation of success he injected phage locally in several places and gave autohemotherapy. The next day there seemed to be definite improvement, but on the second day the patient died. One of the patients who died had an antiphage in the blood which varied strictly inversely with her general condition. Another had a bacterial strain which grew out secondarily in the tube culture.

Three hundred and forty nine of the reviewed cases were cured. In these there was either rapid cessation of the pain with liberation of the core liquefaction of the slough, or complete resolution without absorption. Raiga never saw a furuncle or a localized carbuncle developed into the diffuse form under treatment with phage. Sixty two per cent of all cases were cured in fewer than four days, and 80 per cent in fewer than seven days. Of the furuncles, 80 per cent were cured in fewer than four days and 95 per cent in fewer than seven days. Of the carbuncles, 31 per cent were cured in fewer than four days and 64 per cent in fewer than seven days. By cure Raiga means not only sterilization of the focus, but also complete and final restoration of the normal anatomy.

In 140 cases the blood was examined for antiphage. In one third both antistreptophage and antistaphylophage were found. In another third, one was found without the other and in another third, no antiphage was demonstrable.

Of the cases without antiphage a cure was obtained in 73 per cent in fewer than four days and in 86 per cent in less than a week. Of the furuncles, 93 per cent were cured in fewer than four days and all were cured in fewer than five days. Of the carbuncles, 33 per cent were cured in fewer than four days and 60 per cent in less than a week. In no case did the condition persist over twelve days.

The presence of antiphage reduced these figures considerably. Of the whole group of cases 44 per cent were cured in four days and 63 per cent in seven days. Of the furuncles, only 76 per cent were cured in five days. Of the carbuncles, only 18 per cent were cured in fewer than four days and 40 per cent were cured in less than a week. These figures would have been much worse if autohemotherapy had not been used. When both streptococcus and staphylococcus antiphage were present, the percentage of cures was lowest and streptococcus antiphage alone was more potent than staphylococcus antiphage alone.

HELEN ZAVITZKY JERN M D
FRANK L. MELENEY M D

Palma R.: Experimental Researches on the Pathogenesis of Tetanus Infection (Ricerche sperimentali sulla patogenesi dell'infezione tetanica). *Ann Ital di chir* 933, xli 150.

Palma reports a case of tetanus in which he isolated the causative organism from an abscess of hematogenous origin and cites cases reported in the literature in which the bacillus tetanus was found in parts of the body remote from the original infection or even in the absence of an obvious primary infection.

In experiments carried out to determine the factors favoring localization of the tetanus bacillus in tissues distant from the site of its entry into the body he was able to bring about localization of the organism out of the blood by producing a chemical abscess in the tissues. Late injection of the chemical irritant after the organisms were no longer in the blood stream but in the tissues failed to cause localization. Palma concludes that there are anatomical lesions which are capable of fixing tetanus bacilli circulating in the blood stream, but incapable of drawing them out of the tissues where they are latent.

A LOUIS ROSE, M.D.

Dreyer G. and Campbell Renton, M. L.: The Quantitative Determination of Bacteriophage Activity and Its Application to the Study of the Twerdt-Hillebrecht Phenomenon. *J Pathol & Bacteriol* 933 xxvii 399

The authors point out that quantitative determinations of bacteriophage have generally fallen into three groups (1) the counting of plaques formed when a mixture of bacteriophage and susceptible bacteria are plated on agar (2) the determination of the dilution of a bacteriophage producing complete lysis of a given quantity of bacteria and (3) the determination of the opacity of a bacteria-bacteriophage mixture of known quantities after a given period of contact.

A new method combining Methods 1 and 2 is described. In this procedure a thin layer of agar is spread on a large plate and covered with a fluid culture of bacteria. The excess is poured off and the plates dried for one hour at 37 degrees C. The bacteriophage is carried through a series of dilutions and a drop from each dilution is deposited on the plate by means of a standardized platinum loop. The plate is then incubated and at certain intervals of time a photograph is taken of the plate and enlargements are made to show the plaques clearly as they form. By suitable computation, the activity of any given bacteriophage may be thus determined.

With the use of this technique in the study of a white staphylococcus and a potent phage the authors made the following observations:

1. Plaques began to appear after three hours of incubation.

2. Plaques increased in number up to seven hours. On further incubation, they increased in size but not in number.

3 Weak dilutions of bacteriophage stimulated the growth of the organisms in the early stages of incubation while stronger concentrations did not.

4 With a given series of dilutions of bacteriophage, the number of plaques did not increase in direct proportion to the increase in the concentration of the phage, as has been stated by previous observers but followed a constant curve. When a small number of plaques was concerned, i.e. in the higher dilutions, the curve approximated a straight line, but as the number of plaques increased, the line tended to deviate more and more. In the higher concentrations, a relatively smaller number of plaques was produced. From a large series of observations, a curve could be produced to represent a standard of bacteriophage potency.

5 With a given dilution of bacteriophage, the number of plaques increased with the density of the bacterial inoculum on the agar plate.

6 The concentration of agar affected also the number of plaques to a marked degree. A much greater number of plaques developed on 1.5 per cent agar than on 4 per cent agar and the plaques were larger on the less dense medium.

7 The admixture of homologous dead bacteria in the inoculum resulted in the production of a smaller number of plaques.

8 Bacteriophage kept at 37 degrees C for twenty four hours was less potent than the original phage kept at room temperature.

9 The shape of the curve was essentially the same throughout all of these experiments.

FRANK L. BLENZEV M D

ANÆSTHESIA

Wollesen J M. Avertin Anæsthesia (Avertin-narkose). *Hosp Tid.*, 1933 p 1350-1375

The high hopes which were held for avertin anæsthesia particularly with respect to its safety have been fulfilled only partially. In order to produce complete anæsthesia such large quantities of avertin must be given that they may become dangerous. However if the correct technique and dosage are used the anæsthesia may be regarded as generally safe. When it is induced properly intestinal disturbances such as colitis which were reported formerly can be prevented.

The depth and rate of respiration are first decreased. Gradually however the respiration improves. In order to avoid a combined morphine and avertin effect on the respiration the morphine should be given an hour before the avertin. To relieve this complication many substances have been tried. Occasionally lobelin and cocaine have a favorable effect. Magnesium sulphate has no effect. The interference with respiration can be overcome better by carbon-dioxide inhalation. Avertin has the same effect on the acid base equilibrium as chloroform; it diminishes the respiration for from twenty four to forty-eight hours without causing excessive respiration later. Even in complete avertin anæsthesia the

addition of ether diminishes the period of reduced respiration to about eight hours and in addition opposes the paralysis of the respiratory center. The most effective agent against the respiratory paralysis is coramin which converts the complete anæsthesia into a basal anæsthesia.

Injurious effects on the liver have not been observed after the use of avertin. In cases of diabetes care must be taken in using avertin as it has a tendency to aggravate the condition. Frequently there is a fall in the blood pressure. Avertin is excreted by the kidneys with glycuronic acid. The excretion begins simultaneously with absorption so that an equilibrium is established. If the equilibrium is disturbed in any way by retention of the avertin, signs of a toxic action appear. Rectal administration is of advantage in head surgery as the field of operation is undisturbed. Since avertin is given before the operation an anæsthetist is unnecessary. The anæsthesia lasts for about two hours.

The author believes that, in spite of its defects avertin anæsthesia possesses such great advantages over other types of anæsthesia that it must be regarded as representing an epoch making advance.

HAAGEN (Z)

Salici L. Clinical Research on the Behavior of the Arneth Index and the Hemogram of Schilling After Surgical Operations Performed Under General Anæsthesia (Ricerche cliniche sul comportamento del quadro di Arneth e dell'emogramma di Schilling dopo interventi operatori in narcosi narcotica). *Ann Ital di chir* 1933 xii 309

Salici studied the changes in the neutrophile leucocytes following surgical operations performed under general anæsthesia. He noted that immediately after the operation there was a shift to the left of the Arneth index with an increase in the number of neutrophilic leucocytes of the first class and a decrease of the cells of the third and fourth classes. However this shift was not accompanied by the appearance of immature white blood cells.

In the same cases the Schilling index or hemogram showed an increase in the number of neutrophile leucocytes with a club-shaped nucleus and a corresponding decrease in the number of cells with a segmented nucleus. These changes may be classified as simple hyporegenerative displacement.

No direct relationship between the changes and the dose of the anæsthetic, the duration of the anæsthesia or the severity of the surgical procedure was apparent. The changes in the leucocytes persisted for about three days and were followed by a gradual return to normal.

PETER A. ROSE, M D

Picardi, G: Plantar Ulcers Following Spinal Anæsthesia. Lumbar Ganglionectomy; Cure (Ulcerazioni plantari consecutive a rachianestesia gangliectomia lombare guarigione). *Polidi* Rome, 1933 xi, sez. chir 237

The case reported was that of a girl nineteen years of age who was subjected to appendectomy

October 14, 1931 under spinal anesthesia induced with tutocaine. The pre-operative history was negative. The postoperative course was uneventful until October 18, when several serous blisters developed at the base of each heel. The blisters were accompanied by pain and a sense of heat and tension. They were about the size of a silver dime, irregularly circular, tender and circumscribed by a narrow red zone. Puncture of the blisters on October 21 yielded a lemon yellow fluid. Soon the blisters increased in size and the serum they contained became hemorrhagic. On November 3 the patient inadvertently removed the covering of the bullae exposing shallow ulcers with a somewhat hemorrhagic base which later tended to dry and become crusted. While the patient remained in bed the ulcers became somewhat smaller and were not painful. However they did not heal completely. When the patient became ambulatory the pain recurred because of the pressure and the frequent dislodgment of the crusts. The ulcers were still present when the patient left the hospital.

On October 11, 1932 one year after the appendectomy the patient returned to the hospital because of a persistent ulcer on the right heel which measured about $1\frac{1}{2}$ in. in diameter. The base of the lesion

was grayish-red and exuded a small amount of serum. Passing radially from the base were fibrous scars indicating the original size of the lesion. The old ulcer on the left heel was healed with scar formation. Examination revealed erythema from pain and a negative pilomotor reaction. The injection of pilocarpin caused sweating of the trunk as far as the epigastrum. Temperature studies of the lower extremities after the injection of a foreign protein (mixogen) indicated vascular insufficiency. Oscillometry of the lower extremities yielded normal readings.

Careful consideration of the clinical picture and the physical findings led to the diagnosis of angiospasm associated with trophic cutaneous disturbances. On October 26 a right lumbar ganglionectomy was performed. The right foot then became warmer than the left, and within a short time the ulcer healed.

The cause of such complications after spinal anesthesia has not been definitely determined. Picard suggests that it may be a toxic action of the anesthetic on the posterior roots, variations in the tension of the fluid after the injection, or an aseptic meningitis produced by the anesthetic.

A. LOUIS ROSE, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Desjardins, A. U.: The Radiosensitivity of Tumors Derived from Cartilage. *Am J Cancer* 1933 xviii, 15

From the therapeutic point of view solitary endothelioma is by far the most radiosensitive of all malignant tumors of bone. Its rapid rate of regression under the influence of the roentgen rays and radium is of great aid in its differential diagnosis. It can often be made to regress completely and in some cases adequate treatment produces permanent cure.

True osteogenic sarcoma, so-called usually shows such slight sensitiveness to irradiation that it may be designated as radioresistant. Occasionally it may regress slightly and slowly after exposure to the roentgen rays or radium, but anything approaching complete retrogression even of temporary duration or great improvement in the patient's condition is very rare and authentic instances of complete and definite cure are practically unknown.

Bone tumors derived from cartilage are intermediate between the solitary endothelioma and the osteogenic sarcoma in their sensitiveness to the roentgen rays and radium but the difference between chondrosarcoma and endothelioma is greater than the difference between chondrosarcoma and osteogenic sarcoma. By sufficiently intense irradiation bone tumors derived from cartilage can be made to regress perceptibly and sometimes to a considerable degree for a limited period of time but their complete and permanent disappearance is rare. However the retrogression which occurs usually proceeds at a more rapid rate, and is more pronounced, and lasts somewhat longer than that occurring in osteogenic sarcoma.

In most cases the difference in radiosensitivity displayed by these three types of neoplasm is sufficient to distinguish them clearly irrespective of the findings of clinical, roentgenological or pathological examination.

Desjardins has had occasion to observe a case which seemed to throw light on the diagnostic value of the so-called onion-skin effect in roentgenograms of bone tumors and on the value of radiotherapy as a means of distinguishing solitary endothelioma of bone from other neoplasms arising in osseous tissue.

Simple, benign chondroma affecting bone has never been regarded as sensitive to the roentgen rays or radium. While there is reason to believe that the majority of such processes are not perceptibly influenced by irradiation, it appears that exposure to the roentgen rays or radium may cause certain growths to undergo distinct although limited changes. The author reports a case in which the rate at which the pain subsided and the tumor di-

minished in size corresponded to the rate noted in cases of chondrosarcoma treated by irradiation.

Lowe, E. C.: The Value of Serum Reactions in Radiotherapy of Cancer. *Brit J Radiol.*, 1933 vi, 207

The author cites articles published by Webster Adair and Russ in 1932. Webster discussing X ray and radium treatment of cancer of the breast, suggested that improved clinical results might be obtained by combining irradiation with operation in selected cases. Adair compared the results of treating mammary cancer by operation irradiation and a combination of both and found that the combined treatment was most successful. Russ discussed the theories regarding direct and indirect action on malignant growth and suggested that irradiation produces an indirect action which causes a response from the physiological functions of the body.

By employing a quantitative modification of the Bendien serum reaction it has been possible, in a considerable number of cases of cancer to record variations in the serum. Forms of cancer which develop as a result of injury to differentiated cells are characterized by biophysical, biochemical and metabolic changes termed by Bell cell differentiation and by Shaw cell conversion.

As compared with normal cells, cancer cells show an abnormal lecithin-cholesterol ratio, an increased proportion of hydrophilic protein colloid, a greater water content and greater permeability. These findings do not explain why the majority of persons do not develop cancer. The author believes it logical to ascribe immunity to the presence of a normal defense mechanism capable of destroying cancer cells as soon as they develop. The bases for the assumption of the existence of such a defense are as follows:

1. Bell suggests that there is a defensive process *in situ* which prevents the invasion by normal chorion epithellum. If Bell's theory is correct it would be strange if this function ceased at birth.

2. Such a defense may be a process of evolutionary development.

3. If the characteristic rapid division of cancer cells is due to the abnormal contents of those cells, the same factors would expose cancer cells to easy destruction if there were no substance present in the blood to prevent it.

4. Observations have shown that normal blood is endowed with a lipolytic power. In the blood of persons with cancer this power is very deficient, but recovers partially or completely following removal of the malignancy.

Lowe presents an ingenious diagram to show some of the findings in the enormous field of cancer

research in relation to blood serums which result from or accompany the radium therapy of malignant growths or other forms of treatment causing destruction of cancer cells.

Following damage to differentiated tissue the cells may be killed or may recover and continue their normal existence, or they may remain in a more or less injured state or may enter a pathological process and develop into cancer cells.

As a working hypothesis, the author suggests that the general mass of normal tissues produces a defensive substance, possibly enzymic in character which is capable of destroying cancer cells at once, and that cancer develops only when this tissue defense is deficient.

Numerous observations have demonstrated several changes in the blood serum in association with cancer. These are responsible for an abnormal colloidal reaction with acid sodium vanadate reagents. A positive reaction has been obtained consistently by the modified 3-phase technique in the earliest as well as advanced cases of malignancy and has frequently revealed cancer when it was unsuspected. Of 150 normal persons over thirty-six years of age 9 per cent showed deficiency in the protective reaction. A follow-up of such persons might prove it possible to recognize cases in which prophylactic treatment would be indicated if it ever becomes available.

Experimental work suggests that when cancer cells are destroyed *in situ* and autolysis is produced, a degree of immunity response may occur possibly through stimulation of the reticulo-endothelial system. According to Casper, this is the effect produced in animals by X-ray, radium and lead treatment. Others ascribe the response to the action of a specific serum. According to a third group it is the result of growth regression. All of these theories tend to confirm Bendien's clinical findings and support the theory that immunity responses are initiated in the general normal tissues as the result of the therapeutic cytotoxic of cancer cells.

Pre-operative irradiation of cancer finds support in such experimental observations. In a series of cases of known malignancy of the uterus which were treated at the Radium Institute and Royal Infirmary at Liverpool combined radium and X-ray follow up observations on the serum reaction were made by Gemmell and Malpas. The variations found are shown in 4 graphs. Graph 1 is typical of cases of local destruction of the growth and its disappearance which were associated with remarkable changes in the blood reactions. In these cases the blood reactions were normal ten months later and there was no sign of recurrence after sixteen months. Graph 2 is typical of the serum reaction which remains positive in spite of satisfactory local and general clinical response and makes it possible to predict recurrence as early as five months before its appearance. Graphs 3 and 4 show respectively a satisfactory outcome and a late recurrence. In the latter case recurrence had been foretold by

the serum reaction nine months before its clinical appearance. The diagram and text explain the hypothesis relative to the serum changes which may be connected with the indirect effect of methods of treatment and the destruction of cancer cells *in situ*. The findings indicate that the regaining of immunity as the result of treatment after the development of cancer due to a breakdown of normal tissue defense does not preclude a subsequent similar breakdown. Fluctuations in serum reactions from positive to negative and vice versa suggest that an attempt to regain normal defense may be successful only temporarily. Recognition of such variations may be of aid in the decision as to whether treatment should be repeated or omitted. The quantitative serum reaction might be of value in follow-up examinations for recurrence before it is evident clinically.

Experience in the follow-up observations in over 100 cases suggests that this 3-phase reaction will give evidence of progress under any form of treatment earlier than any other known method. As in successfully treated cases the serum gradually becomes normal, failure to obtain a normal serum reaction indicates that the malignancy has not been eradicated and that recurrence or metastasis will probably follow. A change to abnormal in a subsequent serum reaction will indicate an impending recurrence a progressively more positive malignant reaction will foretell a fatal result and a positive malignant reaction which continues in spite of treatment indicates that only palliation can be expected.

A. JAMES LAXTER, M.D.

RADIUM

Reinhard M. G.: An Analysis of the Factors Entering into Radium Pack Intensities. *Am J Roent* 933 xlii 36

This article is intended to supplement a previous publication which dealt with the relation between a single tube of radium mounted on various thicknesses of wax and several tubes arranged according to other schemes for distances as great as 6 cm. and for as many as fourteen tubes. Since applicators are often mounted in air and in protected packs as well as in wax, the transposing of dosage from one type of pack to another requires further study.

Ionization methods of measuring intensity were employed throughout. The special apparatus for measuring was assembled in such a way that it was not disturbed throughout the experiment. Wax spacing, air spacing, air spacing with walls of brass backed with lead or with lead walls alone were studied. The radiating source was adjustable so that it could be distributed over any area measuring 8 by 3 cm. or less. The radium was in the form of tubes of 50 and 100 mgm. with an outside diameter of 4 mm. and a wall of 1 mm. of platinum. The tubes were mounted on a bakelite tray 1 mm. thick.

With the use of the wax spacers at a distance of 6 cm. from the center of the radium to the center of

the ionization chamber measurements were made of three distributions of the radium (1) four tubes adjacent (2) four tubes parallel but 2 cm. apart and (3) the entire tray filled with tubes arranged to give uniform intensity. The result indicated an intensity decrease according to the increasing area of radiation at the rate of 3.2, 3.0 and 2.7 per minute per gram respectively. On removal of the wax an increased intensity was observed. As this was too great to be explained by wax absorption alone, it was ascribed to additional radiation presumably soft which was removed by wax.

To determine the source of this radiation copper filters varying from $\frac{1}{4}$ to 1 mm. in thickness were placed in one of two positions (1) immediately below the radium and (2) immediately above the ionization chamber. From the results of these measurements the conclusion was drawn that the soft component in the beam was not due to inadequate secondary filtration at the source since the copper filter near the ionization chamber removed these soft rays. As the 1 mm. copper filter immediately over the ionization chamber gave ample filtration measurements were made with the use of this filtration for the three arrangements of radium tubes as previously described. These values agreed with the intensities for wax spacing at the same distance and showed that for small areas of radiation the dosage factor is the same for wax spacers and for air spacing provided adequate secondary filtration in the correct position is employed in the latter case. With the large areas of irradiation the intensity of the wax pack is slightly less than with the air pack.

The influence of the walls on the intensity and character of the rays was next determined. The beam of rays was confined within walls of brass backed with lead or of lead alone. The field size was 10 by 10 cm. With the use of large areas of radiation, 8 by 8 cm. at a distance of 6, 10 and 15 cm. the intensity increased progressively from air walls to brass walls to lead walls. At a distance of 6 cm. the figure was 100 per cent for air, 116 per cent for brass and 128 per cent for lead walls. Therefore for an unfiltered beam an increased wall area produces a corresponding increase in intensity. This increase may be attributed to secondary radiation from the walls.

To determine the quality of this secondary radiation copper filters varying in thickness from $\frac{1}{4}$ to 2 mm. were inserted between the pack and the ionization chamber. Curves of the results are shown. At least 0.5 mm. of copper is necessary to remove these secondary radiations. The absolute values indicate that the intensities for the three types of packs are approximately the same and independent of the wall material when sufficient filtration is used. Within the limits of the experiment the secondary radiation varied only in quantity depending upon the different wall material and not in quality.

The field size or radiated area being maintained by means of lead walls, the effect of changing the distribution of the radium was next studied. It was

concluded that limitation of the beam by the walls had no effect on the intensity.

In conclusion the author states that for the same distribution of radium the intensity of the radium pack is independent of the method of support or mounting whether it be wax, air or well protected packs provided adequate means are employed to remove the soft components of the beam which are characteristic of the arrangement used. When radium is employed with air spacing the secondary filter should be against the skin. In metallic packs it should be outside the aperture opening. The intensity of the pack is independent of the field size and dependent upon the distribution of the radiating points.

A. JAMES LARKIN, M.D.

Kelly, E. Radium Therapy in Carcinoma of the Lip. *J Am M Ass* 1933 c 388

The author presents a study of 335 cases of carcinoma of the lip which were treated in the period from 1913 to 1931. Cases treated during the years from 1921 to 1929 are selected as representative of the success of radium irradiation. Cases treated previous to 1921 have been excluded because (1) nearly all cases referred to the hospital at that time had been rejected by surgeons and (2) the dosage of radium was still in the experimental stage. Only lesions diagnosed as carcinoma by an expert are included. Wassermann tests but not biopsies were done routinely. Ninety-six per cent of the lesions were on the lower lip. Ninety-five per cent of the patients were men, 86 per cent were smokers and 70 per cent were outdoor workers. The average age was fifty-six and eight tenths years.

The 335 cases analyzed are divided into the following 4 groups:

Group 1 cases of lesions not involving more than one half of the lip and with no palpable glands.

Group 2 cases of lesions involving more than half of the lip and with no palpable glands.

Group 3 cases of lesions with definitely palpable glands.

Group 4 cases in which radium and surgery were combined or treatment had been given previously elsewhere.

This report deals chiefly with cases of Group 1 which should be curable by any type of therapy. Patients untraced in January 1932 are excluded and untraced patients with a recurrent growth or lingering symptoms when they were last seen are classed as dead of carcinoma. Accordingly there remain for analysis 137 cases which were treated more than two years ago. Ninety-seven (70.8 per cent) of the patients were well in January 1932, 128 (93.4 per cent) were well two years or longer after treatment, 67 (81.8 per cent) were well five years after treatment and 8 (61.5 per cent) of 13 were well more than ten years after treatment. In general, a patient in Group 1 who remains well for two years may be regarded as cured. Since the average age of incidence of carcinoma of the lip is over fifty-six years it is difficult to carry statistics beyond five years

after treatment because of the high mortality due to inter-current diseases.

Of the 13 patients of Group 2 33.3 per cent were well two or more years after treatment, and 25 per cent were well five or more years after treatment. Failure in cases of Group 2 is due chiefly to the fact that glandular metastases frequently become palpable soon after the patient is first seen.

Of the 36 patients in Group 3 2 were well four years after treatment. In the majority of cases in this group radium irradiation healed the primary lesion and retarded metastasis for months. Attention is called to the fact that metastasis from carcinoma of the lip occurs late since, of 300 patients, 161 (82 per cent) had no palpable glands when they were first examined.

Of the 164 patients in Groups 1 and 2 92 per cent had 1 application of radium. Routine treatment was given with radon bulbs containing from 400 to 750 mc. each filtered by 1.5 mm. of brass and 6 mm. of felt. The dosage varied from 250 mc.-hrs. in the smallest lesion to 1,350 mc.-hrs. in the largest lesion. The average dose was from 500 to 750 mc.-hrs. in 1 application. Healing occurred in from six to ten weeks. Daily removal of the scabs by the patient and painting with 5 per cent mercurochrome were recommended to prevent secondary infection. In nearly all cases the lip healed perfectly without the

slightest scar within four months. Even in cases with wide-spread destruction of tissue there was a remarkable tendency toward normal contour with no contractures. In 6 cases, treatment by the implantation of gold needles or a combination of needles and bulbs was given on account of deep infiltration. High-voltage X-ray irradiation was given to the glands of the neck on both sides, even when they were not palpable.

On the basis of a study of 137 cases in Group 1 the author recommends treatment with radium in preference to surgery for the following reasons:

1. The end-results are excellent—a two-year cure in 92 per cent of the cases and a five year cure in 81 per cent.
2. The cosmetic and functional results are better.
3. Time and expense are saved to the patient and the hospital.
4. The patient can usually carry on his occupation.

For cases in Group 2 the author advises the application of radium to the primary lesion and radical resection of the glands of the neck.

For cases of Group 3 he recommends irradiation of the primary lesion and surgery of the glands except in the presence of glandular function, when radium therapy gives marked palliation.

A. JAMES LARKIN, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Wenkina, J. C.: Cyanosis. *International Clinics* 1933 II, 67

Cyanosis is due to an excessive amount of reduced hemoglobin in the capillaries of the visible tissues. Carbon dioxide is not an important factor in its production. As the organism can accommodate it self to any abnormality when it is given sufficient time, cyanosis is more serious when it develops acutely than when it develops more gradually.

An excessive quantity of reduced hemoglobin is due chiefly to interference with normal oxygenation in the pulmonary capillaries and circulatory disturbances which, although associated with impairment of pulmonary function, depend on pollution of aerated blood with venous blood as in hearts with incomplete septa, and the rate of blood flow through the peripheral circulation. The inhalation of pure oxygen will cause disappearance of the cyanosis if it is due to a respiratory cause, but will only decrease it if it is due to a circulatory cause.

Local causes of cyanosis are local trauma with extravasation of blood into the tissue spaces and venous obstruction such as is produced by thrombosis or external pressure.

Acute laryngeal and tracheal obstructions cause a sudden diminution of pulmonary ventilation with severe cyanosis leading to shock. After the occurrence of shock the deep color of the cyanosis disappears. To prevent circulatory collapse, oxygen must be administered by mechanical means or the obstruction must be relieved immediately. In cases of chronic obstruction cyanosis develops gradually without shock or circulatory collapse because of the compensation established by the organism to the new conditions. Bronchitis (chiefly in infants), bronchial asthma, and pneumonia cause interference with pulmonary alveolar ventilation with a consequent reduction of the percentage of hemoglobin in the arterial stream and the development of cyanosis of a serious nature. Also in these conditions there is an increase in the carbon dioxide content of the blood which causes a dilatation of the capillaries and accentuates the cyanosis by slowing the blood flow and allowing the tissues to absorb more oxygen.

In chronic pulmonary disease including emphysema deep cyanosis with little distress develops because of fibrosis of the pulmonary interstitial tissues with defective gaseous diffusion, a decrease of the tidal air with an increase of the respiratory rate causing interference with pulmonary ventilation, progressive anoxemia causing a compensatory polycythemia and thus deep cyanosis and slowing of the

capillary circulation as the carbon dioxide content in the blood.

In cardiac diseases except congenital, cyanosis is due to a slowing and diminution of the capillary blood stream such as occurs in stenosis with the giving up of more tissue to tissues which results in a higher percentage of reduced hemoglobin. Oxygen therapy may be of use on this circulatory failure.

Alkalosis and narcotic poisonings may increase in the hydrogen ion concentration of the blood with a decrease in peripheral circulation until the partial pressure of the arterial oxygen is insufficient to saturate the pulmonary capillaries. The best treatment in these conditions is the use of 90 per cent oxygen and sodium bicarbonate.

Worina, R. Nervous Disorders Associated with Hemorrhage (A propos des troubles nerveux consécutifs aux hémorragies). *1933 XII 215*

Nervous complications follow hemorrhage in patients with grave visceral disease. It occurs in robust individuals when the hemorrhage is severe. As suggested by Quérin in 1923, the most frequent is probably arterio-occlusion, a paraplegia consecutive to some cases however the symptoms may be different. The plantar reflexes are abolished.

Pinel and Esquirol note that after hemorrhage there is delirium. The severity of the delirium is proportional to the amount of hemorrhage.

After a hemorrhage the patient is susceptible to hypnosis. The fact appears to be explained by the loss of blood.

Experimentally, the hemorrhage of the common carotid artery is only if the animal has had repeated hemorrhages with the clinical features for such a condition. It is relatively benign hemorrhage is fatal. Therefore ligation of the carotid artery is accompanied by a blood loss.

Beard, A. J.: Experimental Hemorrhage. *1933 XII 215*

In experiments on the effects of hemorrhage on the central nervous system.

serum (of curative titer) injected under the skin at a distance from the infected region did not protect the rabbits from a fatal septicemia, whereas the same dose of concentrated serum injected into the skin at the site of the lesion protected the animal.

In another group of rabbits snake venom injected intracutaneously was rendered almost innocuous by the injection of antivenom serum (or even normal serum) around the site of inoculation whereas antivenom serum injected under the skin at a distance from the site of the injection of the venom or into the peritoneal cavity had no effect on the evolution of the characteristic skin lesions, and antivenom serum injected intravenously did not have a constant effect.

When a third group of rabbits were injected with vaccine virus isolated from animals dying from post-vaccinal meningitis-encephalitis it was found that antivenom serum of very weak dilution injected at the site of the injection of the virus prevented the formation of the skin lesion (even as late as twenty-four hours after the inoculation) whereas concentrated serum given elsewhere had no effect.

In experiments on guinea pigs in which tetanus toxin was inoculated and antitetanic serum was applied locally in liquid and in ointment form, both the liquid and the ointment were effective in preventing the symptoms of tetanus.

In experiments on rabbits in which diphtheria antitoxin was rubbed into the skin in the form of a cream (lanolin-vaseline) and diphtheria toxin cream was rubbed in on the following day the antitoxin was found to protect the animal. These experiments were controlled by substituting normal serum for antitoxin cream. When in other experiments the toxin cream was used first, the antitoxin cream protected the animals if it was rubbed into the skin within three hours.

Beardie draws the following conclusions:

1. Serum given into the skin is absorbed so slowly that anaphylaxis does not occur.

2. A barrage of serum can be directed toward an infection while it is still localized.

3. When thus injected the serum comes into contact with the tissues in a very concentrated form whereas when it passes through the blood stream it arrives at the site of infection much diluted.

4. Antibodies may be prevented from reaching the affected area through the blood by a barrier of inflammation and edema. *MARSH W. POOLE, M.D.*

Gibson H. J. and Thomson W. A. R.: A Study of the Etiology of Acute Rheumatism with Special Reference to the Relationship of the Hemolytic Streptococcus to the Disease. *Edinburgh M J* 1933, 4, 93.

The authors report investigations regarding the cause of rheumatic fever in which they attempted to determine the rôle played by the hemolytic streptococcus and allergy to its products. Patients with rheumatism were treated by the intradermal injection of extracts of a variety of streptococci, hemolytic and non-hemolytic, isolated from persons with and without rheumatism. At the time of the tests, throat swabs were taken. Throat swabs from 300 persons with rheumatism and 143 controls showed no significant difference between the 2 groups. In the cases of persons suffering from rheumatism the incidence of positive reactions to intradermal tests with the hemolytic streptococcus and extracts was found to be 68.1 per cent, whereas in the controls it was 55.4 per cent. When cases of acute rheumatism were divided into febrile cases, afebrile cases, and cases of chorea, intradermal tests with hemolytic streptococcus extract were found to cause a positive skin reaction in 58 per cent of the febrile group, 77 per cent of the afebrile group and 96 per cent of the cases of chorea. In the febrile control cases the incidence of positive skin reactions was 50 per cent and in the afebrile control cases it was 77 per cent. Diminution of the activity of the skin is a non-specific phenomenon which has been called a protective reaction. As the figures for the control series show it may occur in any febrile wasting or cachectic condition.

The relationship between tonsillitis and acute rheumatism was also investigated. Seventeen (14 per cent) of the patients with rheumatism gave a history of sore throat or tonsillitis immediately before the onset of the rheumatic symptoms. Even though more than half of these patients were febrile, 82 per cent of them had a positive skin reaction to hemolytic streptococcus extract. Of the 30 patients whose tonsils were inflamed at the time of their admission to the hospital, 35 per cent had a positive skin reaction to the hemolytic streptococcus, and of those whose tonsils were enlarged but not inflamed, 70 per cent had a positive skin reaction.

The association of scarlet fever in the cases of rheumatism and cases without rheumatism was not significant.

The authors conclude from their observations that there is no essential difference between cases of rheumatism and control cases as regards the skin reaction, the presence or absence of hemolytic streptococci of the throat, or the relations between skin reactions and throat cultures. They believe that acute rheumatism is due to some infective agent not yet recognized, the entrance of which into the body may be facilitated by infection with the hemolytic streptococcus. They suggest also that the late allergic manifestations of streptococcal infection may damage tissues susceptible to rheumatic infection and thereby favor generalization of the infective agent. *ALTON OGDEN, M.D.*

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DUCTLESS GLANDS

Ortenberg, S.: Parathyroid Dysfunction; Report of a Case Treated with Parathormone and Irradiated Ergosterol. *Canadian M An J* 1933, xxviii, 490.

The author reports a case in which there was marked bone rarefaction in both tibiae the pubic

rami and the head and neck of both femora. In the roentgenogram the rami of the pubic bone had a cotton wool appearance and the periosteal outline was shaggy. In the other bones, but most strikingly in both ilia, there were rounded or oval shadows large and small, with complete absence of lime density. The roentgenological diagnosis was osteitis fibrosa cystica.

Later the patient sustained a fracture of the right tibia and fibula and the third metatarsal bone. Four months after the injury there was no callus formation even though cod liver oil, viosterol, and calcium were given.

Four months after the injury the blood calcium was found to be 10.33 mgm. and one month later it was 9.8 mgm. per 100 c.cm. No tumor was palpable in the neck. Following the second blood-calcium determination a daily dose of 50 units of parathormone was given for five days each week for several weeks. Two weeks after the beginning of the hormone therapy the blood calcium was 9.8 and the inorganic phosphorus content of the blood was 3.3 mgm. per 100 c.cm.

Under the parathormone therapy the edema disappeared from the ankles, callus was formed and the

patient became able to walk with the aid of a cane within six weeks. A ray examination of the bones six months after the beginning of the hormone therapy revealed a definite increase in the density of the bones and definite evidence of filling of the cystic defects with bone.

The author calls attention to the fact that in true generalized osteitis fibrosa cystica hyperparathyroidism can be demonstrated but callus formation is unimpaired. In the case reported in this article bony union was absent and there was neither hypercalcemia nor a palpable tumor of the parathyroid glands. In favor of a diagnosis of osteitis deformans were the patient's age and the poor callus formation but against it was the absence of pathognomonic changes in the calvarium. Osteomalacia was also ruled out. Therefore the condition was designated by the all inclusive term osteodystrophy.

In discussing the literature the author expresses the opinion that a decalcifying effect exerted by parathyroid hormone is due to toxic doses and that the case he reports in this article shows that when the hormone is given in small i.e. possibly physiological, doses it may be a positive or anabolic factor in calcium metabolism. EARL O. LATIMER, M.D.

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COLLECTIVE REVIEW

THE PROSTATE GLAND AND VESICAL NECK

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FREEMAN (24) states that non venereal prostatitis is a definite entity and that at least 20 per cent of cases of prostatitis are non venereal. He contends that the prostate is a definite portal of entry for bacteria and should always be considered a possible focus of infection. Non-specific prostatitis may be secondary to a focus elsewhere. Therefore in the treatment of prostatitis other foci of infection should be removed or cleaned up. Boyd (3) says that the use of heat in the treatment of prostatitis assists the body in localizing and overcoming infections by temporarily increasing the circulation, favors absorption, and relieves pain. As the parts should be kept at rest, he regards it as inadvisable to apply the heat by injecting hot water and having the patient expel it. Instead, he advocates the use of a two-way rectal tube made of metal.

Bohannon (2) reports a case of marked urticaria in which prostatitis was the only pathological condition found and treatment of the prostatitis resulted in relief of the urticaria. He believes that latent prostatitis is frequently a focus of infection causing neuritis, arthritis, ocular lesions, and other pathological conditions.

From the extensive study of autopsy material and the cysto-urethroscopic findings in clinical cases, Hyams and Kramer (32) conclude that fibrosis of the vesical orifice is due definitely to inflammation from surface infection or irritation of the submucous glands of the vesical neck and trigone. The inflammation preceding the fibrosis and causing obstruction of the vesical neck they term 'pre-fibrotic median bar'. This condition is always associated with an inflammatory reaction

in the prostate seminal vesicles and ejaculatory ducts. There may or may not be residual urine. Patients with pre-fibrotic changes at the vesical neck complain more of discomfort or spasm at the internal sphincter than those with fibrotic median bar. In pre-fibrotic changes the punch or cutting current proves unsatisfactory and often exaggerates the symptoms. The treatment of choice is dilatation and the local application of heat.

Cancer of the prostate has been much discussed in the urological literature of the past year, chiefly with respect to its treatment by transurethral resection. Caulk and Boon-Itt (9) reported 222 cases of carcinoma of the prostate. They state that this condition is responsible for 5.6 of every 1,000 male deaths. They emphasize the importance of the correction of chronic inflammation in its prevention. Their treatment consists of a cautery punch operation to relieve obstruction supplemented by radium and X-ray therapy. Relief of obstruction was obtained in 72 per cent of their cases. Twenty nine per cent of their patients survived for three years or longer and 10 per cent for five years or longer.

Ferguson (22) concluded from his own cases and the reports of others that cancer of the prostate does not always originate in the posterior lobe as has been believed. It has been definitely shown that cancer may arise in any portion of the prostate or its accessory lobes. Ferguson groups carcinomata of the prostate into 3 groups according to the symptoms, histological findings and degree of malignancy. In addition, he classifies them clinically from the standpoint of irradiation therapy into the following 2 groups

1 Those suitable for palliative therapy only. Such tumors are of considerable size and have formed demonstrable metastases. Palliation may be secured by external irradiation alone.

2 Those suitable for radical therapy. Such tumors measure less than 5 cm. in diameter and have formed no metastases. For this group a kethal tarase dose requires the use of both external and interstitial irradiation.

For temporary relief Colston and Lewis (15) have suggested the punch operation in its varying forms. They classify cases of malignant disease of the prostate into (1) those in the early stages which are suitable for radical operation (2) those without marked urinary obstruction but too far advanced for radical removal, in which irradiation with the X-rays or radium may inhibit or cause some retrogression in the growth and (3) those with varying degrees of obstruction which may be relieved by local and radium therapy.

Colston and Lewis advocate permanent suprapubic cystotomy only as an emergency or palliative measure.

Fruchaud (15) reports a case of advanced cancer of the prostate in which marked urinary symptoms and retention were overcome by suprapubic cystotomy. A biopsy diagnosis of carcinoma of the prostate having been made 480 mc. of radium were given within a month by means of radium needles introduced transperineally and radium seeds introduced by the abdominal route. Four and one half years later when the patient presented himself for hernial repair he was in very good condition. The prostate was small, not indurated, and showed no signs of cancer.

A study presenting the clinical and X-ray findings in 13 cases of bone metastases from cancer of the prostate which had no local diagnostic features was published by Haguenauf and Gally (30). Common sites of metastases were the vertebrae, iliac bones (particularly at the sacro-iliac junctions) and the epiphyses of the long bones.

DeRoon and Thomas (20) reported a case of rhabdomyosarcoma of the prostate in which the diagnosis was confirmed at autopsy.

Among the articles concerning suprapubic prostatectomy which have appeared in the past year was a discussion by Rathbun (49) of several phases of prostatism and prostatectomy about which there is still a difference of opinion. Cardio-vascular complications are very common and were responsible for the majority of deaths in Rathbun's cases. Rathbun subscribes to the view that prostatic hypertrophy is primarily a vascular disease, and emphasizes that an experienced internist should be in close co-operation with the

surgeon. As most patients develop urinary infection he believes it advantageous to allow this to occur before prostatectomy so that the patient's resistance to it can develop. For the control of hemorrhage he carefully places a pack in the prostatic bed. He has all of his patients typed for transfusion and always performs the prostatectomy in 2 stages.

Toxic psychosis is a very important complication but receives little attention in textbooks or the literature. Rathbun believes the underlying factors to be cerebral arteriosclerosis, sepsis, and uremia. The treatment consists of the dilution and elimination of toxins and drug control of violent delirium.

Keyes (33) reviewed prostatic surgery from the standpoint of his own and his father's results in the period from 1890 to 1930. In contrast to Randall he believes there is not uncommonly a sclerosis of the prostate distinct from the sclerosis of the vesical neck. The operation he prefers for vesical neck sclerosis is suprapubic resection by means of a rongeur. He employs this method in cases in which the Caulk and Young punch have failed. He has not used the urethral procedure of Davis or McCarthy.

Kretschmer (35) stresses the fact that pre-operative care by the urologist and internist has decreased the mortality of prostatectomy. He states that the internist has done much by improving the condition of patients suffering from benign hypertrophy of the prostate with complicating factors such as cardiac, diabetic, and other general disorders. He discusses also the urological preparation of the patient with the indwelling catheter or by suprapubic cystotomy. He states that both methods have staunch adherents and that he has had good results from both of them. His routine pre-operative examination consists of chemical examination of the blood, tests of kidney function, cystoscopic examination, flat-plate X-ray examination of the genito-urinary tract, and occasionally intravenous pyelography.

Riches and Muir (50) studied the prostate gland and the history in 114 cases of prostatectomy in an attempt to establish a relationship between the type of prostate, the symptoms, and the prognosis after prostatectomy. The following histological classification of benign prostates is suggested (1) glandular enlargement, (2) intermediate form with some fibrosis in the glandular tissue, (3) fibrous prostate and (4) calculous prostatitis.

Riches and Muir conclude that complications are fewest, the mortality is lowest, and the end-

results are most satisfactory in the glandular type the mortality is highest in the calculous type and the end-results in the fibrous and calculous types are less satisfactory than those obtained in the glandular type. No attempt is made to evaluate the different operations and the general physical condition of the patients is not taken into consideration.

Lichtenstern (36) has performed 600 prostatectomies with a mortality of 3.8 per cent. He attaches great importance to the pre-operative study of the case. He supplements his clinical impression of the patient by (1) experimental polyuria (2) quantitative estimations of the urinary salts on consecutive days, (3) determinations of the nitrogen excretion on a known protein diet (4) determinations of the blood urea and total non-protein nitrogen (5) an attempt to simulate the strain imposed on renal function by prostatectomy by placing the patient on a high nitrogen high chloride and limited fluid intake and then studying the blood chemistry, (6) a study of renal function by intravenous urography and (7) a study of the residual urine in the bladder.

In the cases of patients with a small amount of residual urine Lichtenstern is not opposed to bilateral ligation of the vas and deep X-ray therapy. In the cases of patients with a large amount of residual urine who are not good operative risks, he implants radium in the lobes of the prostate through a perineal incision. However, in the majority of cases he performs a suprapubic prostatectomy, preferably in a single stage.

Calka (7) emphasizes the importance of thorough preparation of the patient by a 2-stage operation except in early cases. For malignancy of the prostate he favors the perineal operation because the capsule and seminal vesicles can also be removed in this way.

Cholcov (11) believes that infection is the greatest danger of prostatic hypertrophy with obstruction. Mechanical damage to the kidney due to backpressure is also important. In early cases prostatectomy is not especially dangerous. In later cases, a 2-stage suprapubic operation should be done. A Pilcher bag is used for haemostasis.

Devine (21) suggests several refinements in the technique and after-care of prostatectomy. He uses special spoon retractors which distend the bladder wall. They serve also for illumination as they contain a small electrical lamp. With the patient in the Trendelenburg position, one "spoon" may be used to catch the blood which is removed by suction.

In the removal of the gland a circular incision is first made around the internal urethral orifice. The prostate is then dissected out, the dissection starting on its posterior surface. Bleeders are clamped or tied. After removal the mucous membrane in the vicinity is dissected up and stitched to the prostatic bed. To aid in the healing a special drainage tube with a suction attachment is inserted as far as the cavity from which the prostate was removed.

Crosbie (17) is opposed to catheter drainage for the preparation of patients with prostatic hypertrophy for operation. He avoids the use of all drugs before and after prostatectomy. He never irrigates bladders even after the second stage and he objects to manipulation such as is necessitated by cystoscopy cystography and ureterography. He believes it preferable to wait too long between stages rather than not long enough, and he performs bilateral vasectomy routinely.

Thompson (56) presents many details in the operative pre-operative and postoperative treatment of prostates which are of importance in the success of prostatectomy. Before the operation, he has the patient taught thoracic respiration by a nurse. The usual functional tests are carried out and the patient allowed to become accustomed to his surroundings. Thompson has no fear of using the catheter if proper precautions for antisepsis are taken. It has the advantage of revealing local conditions of the urethra.

At operation the bladder is filled with a mild antiseptic solution until it rises just above the pubis. The perivesical spaces are packed off and the bladder is opened transversely. The adenoma is removed and haemostasis obtained by sutures or a pack. If there is no bleeding the bladder is allowed to fall back into its normal position. The prostatic cavity itself is drained by a glass tube equipped with an oblique flange. Rubber is not used. Sutures are placed through fascia and skin with avoidance of the rectus muscle. In order to prevent local oedema sutures are omitted from the lower part of the skin wound. Before the dressing is applied the penis and scrotum are strapped high on the abdomen.

Close (12) offers a modification of the Harris method of prostatectomy in which the bladder is closed at operation. He has tried this modification in 6 cases. In 5 it was successful. In 1 case re-opening of the bladder was necessary because of a secondary haemorrhage due to a retained gauze tampon.

The usual suprapubic incision is made. The enucleation of the prostate is performed intra-urethrally in order to preserve as much mucosa

on the bladder aspect as possible. Next, a purse string suture of No. 2 plain catgut is passed in and out around the margin of the bladder mucosa, the latter being transfixed at 6 or 7 points by means of a boomerang needle. Then, a Size 13 E Pezzar catheter is inserted and carried through the urethra by a special instrument much like the mandarin used to carry an ordinary urethral catheter. The pursestring suture is tightened around the Pezzar catheter behind the bulge and traction sufficient to control the bleeding is made by fixing the catheter to the thigh with adhesive tape. The bladder is tightly closed and the space of Retzius drained with 2 rubber drains. The traction is released after twenty-four hours, and the catheter is removed on the eighth, ninth or tenth day.

An estimate of the value of cystograms and urethrograms in the diagnosis of prostatic obstruction is made by Crabtree and Brodnev (16). They show these X ray studies to be important diagnostic measures especially when intra urethral treatment alone is to be employed. They afford also a means of showing graphically the etiological factors of poor postoperative functional results. Cystograms disclose 3 major variations from the normal filling defects of the bladder base, elevation of the bladder base above the symphysis, and asymmetry of the bladder base manifested by irregularity of the curve. In cases in which the gland is large urethrograms show increased length of the prostatic urethra from the caput to the internal orifice and narrowing or flattening and deviation from the midline of the prostatic lumen.

Wills (61) presents a new instrument for use in suprapubic prostatectomy. It consists of a tube with a pair of 3 toothed jaws which can be made to stand at right angles from the tube by controls at the free end. When inserted into the prostatic urethra this tube holds the prostate firmly, allows it to be drawn upward and forward, permits enucleation with scalpel and Mayo scissors, and renders the introduction of a finger into the rectum unnecessary.

For the administration of surgical diathermy to the enlarged prostate Vogel (66) recommends a Tiemann catheter with a ring electrode. Good results are obtained not only by the burning away of tissue but also by the shriveling and retraction which take place with the healing. The hollow catheter with a full bladder prevents burning of the bladder as fluid escapes as soon as the eye of the catheter enters the bladder.

Gil Vernet (27) recently described a new method of penile prostatectomy which is su-

perior to the old perineal procedure because it can be performed rapidly without danger of injuring the posterior urethra or rectum and is not followed by incontinence or rectal fistula. He terms his operation the "perirectal route." An arched cutaneous incision 4 cm. long is made in the perineum 1 cm. from the anus. The center of the perineum is cut, and by finger dissection the perirectal space is opened sufficiently to expose the posterior surface of the prostate. The latter is incised in the midline and the prostate enucleated. A Pezzar catheter is inserted up to the bladder and the prostatic cavity tamponed.

Haim (31) makes an incision passing between the rectum and the external sphincter of the anus, the latter being supported above by a special valve. By blunt dissection, he reaches the posterior surface of the prostate through the retro-vesical septum. A retractor in the form of a catheter which facilitates enucleation is introduced. Enucleation is done in the manner of a hypogastric prostatectomy. Bleeding vessels are ligated and a permanent urethral catheter is inserted. A tampon is left in for twenty-four hours.

Haim says that in cases of large adenomatous lobules it is possible for the urethra to be injured slightly during enucleation, but this danger is not serious. Moreover because of rapid contraction and retraction of the unimpaired muscles, the wound remains as a fissure and excudation soon ceases.

Moszkowicz (42) suggests that prostatic hypertrophy may be an endocrine disturbance. He states that the swelling in prostatic hypertrophy has long been believed to arise from the glands nearest the bladder neck surrounding the urethra. It has been found that hermaphrodites with dominant male characteristics (possessing testes) and also female hermaphrodites (possessing ovaries) have prostate tissue. In the female hermaphrodite the prostatic tissue is at the neck of the bladder proximal to the colliculus seminalis. In the male hermaphrodite it is distal to the colliculus. This condition prevails also in the embryo. In the female embryo a prostatic anlage is found proximal to the muellerian ducts, and in the male embryo distal to the wolffian ducts. In the female the hypertrophy nearby always occurs in the more proximal glands and can therefore be compared to the enlargement of the male breast in endocrine disturbances and following castration. From a study of the findings at autopsy on 100 males of all ages, Ljubin (37) draws the following conclusions regarding the prostate gland.

On the basis of the outer contour 3 types can be distinguished

1 The embryonic type. In this type the length of the gland is as long as, or longer than, the cross diameter and somewhat cone shaped

2 The differentiated type, in which the length is about one half the cross diameter and roughly resembles a chestnut in shape.

3 A type in which the length is from 40 to 80 per cent of the cross diameter

In children the embryonic type, and in adults the differentiated type, is the most common. After the age of fifty years the frequency of the embryonic type increases again.

Stature has some relation to the type of the prostate. In short men the prostate is more apt to be of the embryonic type, whereas in tall men it is more apt to be of the differentiated type.

From birth, the prostate in man is a single organ with different surfaces but no distinct lobes. The normal prostate has no isolated middle lobe.

Melen (41) reports a case of multilocular cyst of the anterior lobe of the prostate which caused symptoms similar to those of hypertrophy of the prostate. The rectal findings were negative. The gland was removed by suprapubic prostatectomy.

Margold (38) reports a unilocular cyst of the prostate causing symptoms of obstruction at the vesical neck in a man fifty four years of age. The cyst was removed by suprapubic operation.

The phase of urological surgery receiving the widest discussion during the past year was probably transurethral resection of the prostate. As early as 1830 Guthrie devised an instrument and described an operation for the correction of bar obstruction of the neck of the bladder. Bottini introduced his cautery incisor in 1874. Freudenburg in 1897 and Chetwood in 1901 modified the Bottini instrument, but the lack of visualization resulted in numerous accidents and caused their instrument to be discarded.

Interest in the transurethral relief of vesical neck obstruction was renewed by Young in 1909 when he presented his punch. Caulk, in 1919, introduced his cautery punch in which the use of the cautery blade to section tissue and reduce hemorrhage permitted the removal of more tissue.

In 1926 Collings reported the sectioning of bars and contractures by means of a high frequency electrical current with suitable electrodes through the panendoscope under vision with a lens system. He emphasized that his procedure should be limited to bars and contractures of the vesical orifice. The same year Stern presented his ingenious instrument which he called a 'resectoscope.' This instrument is superior to its predecessors.

In 1930 Kirwin introduced his resector, in the use of which an electrode is employed to coagulate the tissue for hemostasis prior to its removal by a rotating knife. During the past year, McCarthy has adapted the principle of Stern, using a cutting loop through a specially constructed instrument. With this he has had remarkable success in remodeling the prostatic urethra. Numerous others have made modifications of instruments previously introduced.

Davis (18-19) uses the Stern resectoscope with the Bovie-Davis high-frequency unit. The cutting current is a moderately damped current. In the same instrument a highly damped unit for coagulation is incorporated. Davis has operated on 339 cases of vesical neck obstruction representing all types. The amount of tissue removed varies from 15 to 45 gm. Eleven early cases required repeat resections within six months. Two cases required 2 stage resections. The average hospital stay was four days. A recurrence developed in 1 case.

When the Bovie-Davis unit is employed there is practically no hemorrhage. The highly damped current is always available for bleeders. In 2 cases cited secondary hemorrhage was easily controlled transurethrally.

Infection is negligible, only 15 per cent of the patients had a temperature elevation. In 40 cases resection was done for carcinoma of the prostate. There were no deaths immediately following the operation. Of 3 deaths which resulted later, 2 were cardiac deaths and 1 was due to hemorrhagic nephritis and uremia.

In every case in which the residual urine before the patient's discharge was more than 2 oz. it was later found not less than 1 oz.

McCarthy (39-40) gives credit to Stern for the assembling of the essential elements of the modern resectoscope and to Davis for demonstrating the feasibility of resection of the prostate under proper conditions. The ideal requirements for this operation are (1) most precise visualization of the prostatic urethra (2) the greatest possible flexibility of manipulation under vision, of the electrical cutting loop (3) ample electrical power to excise the obstructing prostate under water with minimal hemorrhage and tissue coagulation, (4) interchangeability and ease of manipulation of electrodes in the closure of bleeding points, (5) completion of the operation, including the introduction of a whistle tip indwelling catheter, with but one introduction of the instrument, the sheath being withdrawn after the catheter has been passed through it. When given by an experienced urologist, this type of treatment is adequate in

cases of prostatic fibrosis and for relief in prostatic carcinoma.

Bleeding is controlled under vision before removal of the instrument. A special type of bag for hemostasis has been perfected for use in cases of persistent oozing. As much prostatic tissue as is desired may be removed and the experience of Caulk and Davis indicates that the results are relatively permanent. McCarthy has seldom had to repeat the procedure. The preliminary care should be the same as for prostatectomy.

Nesbit (43) states that with the use of the resectoscope it is possible, under continuous direct vision, to excise any vesical neck obstruction, whether it is scar contracture, carcinoma, or hyperplasia of the prostate, with practically no loss of blood and with surprisingly little post-operative reaction. Either low spinal or sacral anesthesia is used. Nesbit has done 50 such excisions himself with no mortality. He reviews Davis' 500 operations and Alcock's first 118 operations.

Plaggenmeyer and Weltman (48) state that in cancer of the prostate resection is preferable to permanent suprapubic cystostomy, and that in prostatic enlargement removal of the obstructive portion of the prostate by the resectoscope is proving less dangerous and time-consuming than and just as beneficial as, prostatectomy.

Contra indications are large stones in the bladder, large diverticula of the bladder and cases in which catheter drainage is not tolerated.

Stirling (55) gives a rapid review of the development of the resectoscope and the technique of its use. He emphasizes the importance of pre-operative preparation. He believes that the use of the resectoscope is indicated for bars, median lobes, and prostatic hypertrophy of Grades 1, 2 and 3 and that it is contraindicated for prostatic hypertrophy of Grade 4, vascular prostates, and patients who are debilitated. In a series of 30 cases of transurethral resection, Ockerblad (45, 46) had 1 death. This was due to secondary hemorrhage on the tenth postoperative day. Good results were obtained in 29 cases. The average stay in the hospital was fourteen days, and the average number of postoperative days in the hospital was six. In 4 cases repeated resections were necessary. A case in which postoperative epididymitis developed is reported.

Pedroso (47) reports the first 10 cases of prostatic hypertrophy which he treated by resection. He states that the value of this method as a substitute for prostatectomy will be determined by the permanency of the cure. Its immediate results are very satisfactory.

Shivers (54) states that the transurethral operation is feasible when a more serious operation would be dangerous. He performs prostatectomy only in cases in which there is an accompanying hypertrophy of the lateral lobes. In all other cases the results of the transurethral operation are excellent, the symptoms of prostatism subsiding completely.

Bumpus uses the direct vision Braash cystoscope which is provided with a suitable fenestra. The tissue engaged is first coagulated by a multiple-needle electrode, after which it is removed by a sharp tubular knife. Bleeders are taken care of by a Bugbee electrode with a coagulating current. Hemorrhage is seldom an alarming complication. A catheter of large caliber is inserted and left in for from forty-eight to seventy-two hours to permit free drainage and thereby lessen the danger of bleeding. Failures result only when insufficient tissue has been removed. Of the 250 cases which Bumpus reports, a subsequent prostatectomy was done in 9. There were 6 deaths in the 250 cases. Four were due to sepsis and 1 was a cardiac death. Forty-six patients had multiple resections. Reactions for hypertrophy and adenocarcinoma give the best results.

Caulk and Wiseman (10) also report good results from the transurethral resection of prostatic obstructions. They urge urologists to investigate thoroughly and observe results over a period of time before condemning a new procedure, especially a procedure for the operative relief of prostatic obstruction. They emphasize the importance of pre-operative care in this method of treatment and from a long experience conclude that transurethral resection is adaptable to practically any type of prostatic obstruction. They discuss their technique in various types of cases and give exceptionally low mortality figures. They urge more universal adoption of the method in preference to radical operation.

Not all urologists are as optimistic about transurethral resection. Although a majority of the articles reviewed seem to be by those who favor the method, Cabot (6) among others, advises against overenthusiasm regarding it. He believes that the method is becoming too popular too fast, and that more conservative surgeons will continue to do either perineal or suprapubic operations at least in cases of marked hypertrophy.

In another article Cabot (5) states that the mortality of transurethral resection at the Mayo Clinic is somewhat under 3 per cent, which is lower than that of any other operation. One of the chief advantages of the method is the brevity of the hospital confinement averaging from

seven to ten days. Cabot hesitates to advise transurethral resection for cases of enormous enlargements and large median lobes which herniate into the bladder but is of the opinion that within the next few years it will be done in perhaps 75 per cent of cases of prostatic hypertrophy.

Although Collings (14) has himself devised an instrument for transurethral operation and reports excellent results from its use in selected cases he believes that only small and moderate sized prostatic obstructions may be effectively removed by transurethral operation. Because of instrumental difficulty and prolonged cystoscopic manipulation marked enlargement is best relieved by prostatectomy.

Kirwin (34) believes that the transurethral operation is the ideal procedure for contraction of the vesical neck, carcinoma of the prostate (if any instrumentation is possible), congenital valves of the urethra, subcervical hypertrophy of Albarran's glands, slight enlargement of the median lobe, moderate median lobe hypertrophy with small intravesical protrusion of the lateral lobes, intra urethral projection of enlarged lateral lobes, and slight enlargement of the lateral lobes without enlargement of the median lobe. For the patient in good physical condition presenting marked intra urethral and intravesical protrusion of the lateral lobes as well as hypertrophy of the middle lobe, open operation will always be indicated. When the intra urethral route is followed exactly the same pre-operative precautions must be observed.

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ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Gallols Japiot and Levy: The Architecture of the Skull, its Functional Role and Mode of Resistance (Architecture du crâne, son rôle fonctionnel, son mode de résistance) *Rev. de chir., Par.*, 1933 lli 371

The skull supports the face, participates in the movements of the face, and contains and protects the brain. Externally it acts as a lever supporting the face and resting upon the spine as a fulcrum. Internally it is arranged to suspend and shelter the brain and permit it to follow the movements of the head. The meninges and their partitions are intimately attached to the inner surface. Structurally the skull is composed of two layers. The internal lamina is dense and homogeneous and, together with the dura mater envelope and protects the brain from external violence. Its function is passive. The external lamina is arranged in accordance with Wolff's law. It is more elastic than the internal lamina and is rarely fractured alone. The inner lamina is brittle and first to fracture.

LEO M. ZIMMERMAN M.D.

Wilensky A. O.: Osteomyelitis of the Skull. *Arch. Surg.*, 1933 xlvii 83

The clinical picture presented by the majority of cases of osteomyelitis of the skull is very similar. The infection arises as a primary or extension process or occurs as a manifestation of a hematogenous infection. It is rare as a primary disease. It is most common as an extension process after nasal accessory sinus disease. It is relatively rare as a hematogenous infection, and is least common as a complication of an otological infection.

The osteomyelitis begins in the diploe. From there the infection spreads through the outer table, giving rise to subperiosteal abscesses beneath the scalp and inward, sometimes giving rise to extradural or subdural abscess, general meningitis, cerebral abscess, or thrombosis of the longitudinal or other large sinuses.

The dura mater is affected in practically all cases. The pachymeningitis may remain localized a long time. Thrombosis occurs chiefly in the cavernous, lateral or longitudinal sinuses. The invasion of a large venous sinus is often manifested by emboli with distant metastases. Pneumonia or bronchopneumonia frequently occurs.

It is generally easy to make a diagnosis of osteomyelitis in the bones near the orbit or ear but it is often difficult to recognize the diffuse form because the general symptoms may mask the local symp-

oms. A diagnosis may be made before operation if a careful study is made of the symptoms that accompany the sinusitis or mastoiditis.

When the osteomyelitis becomes evident operation is necessary and should be as extensive as possible. The cranial bones should be resected beyond the limits of the lesion. If the wound continues to granulate and if the temperature remains high, sequestra are present and should be removed as completely as possible.

The mortality is high.

SAMUEL KATIN M.D.

Doench H. O.: Air Embolism in Injuries of the Longitudinal Sinus (Luftembolie bei Verletzung des Sinus longitudinalis) *Zentralbl. f. Chir.*, 1933 p. 486

In a review of the literature the author was able to find the report of only one case of air embolism from direct sinus injury. This was a case reported by Bergmann and not completely explained. Operative injuries of the cerebral sinuses have been reported by Genzmer and Kuhn. Cramer found that under normal conditions and in the horizontal position there is a positive pressure of at least 90 mm. of water which prevents air embolism in case of sinus injury. Danger arises only when the patient is exsanguinated or operated upon in the sitting position under which circumstances the positive pressure is replaced by a negative pressure.

The author reports a death from air embolism due to injury of the longitudinal sinus. The patient was a boy eleven years old who was treated for a 10-cm. occipital wound and a depressed fracture caused by a hatchet. In the cleaning up of the wound and the removal of the bone fragments a tear occurred into the longitudinal sinus. This was immediately tamponed. An anterior ligature was then applied but before occipital ligation could be done the fatal embolism was manifested by a hissing sound. Doench concludes that the first ligation should be done proximally.

PLENKE (Z)

Bercher J. and Friez, P.: Classification of Anterior Dislocations of the Temporomaxillary Articulation (Classification des luxations antérieures de l'articulation temporo-maxillaire) *Presse Méd.*, Par., 1933 xli 644

From the numerous articles on dislocation of the temporomaxillary articulation which have been published since 1920 the complexity of the mechanical disturbances in the region of this articulation is apparent. In a review of this literature the authors were impressed by the lack of agreement as to

nomenclature. They have therefore attempted to formulate a clinical classification of these dislocations, especially those of the recurring type. They divide the dislocations into three groups—the dynamic, the kinetic, and the static.

Dynamic dislocations are produced by an excessive forced active or passive lowering of the mandible.

Kinetic dislocations occur during the course of normal movements of the temporomaxillary articulation. Whereas constant attention of the patient may prevent recurrences of the dynamic type of dislocation the kinetic type occurs on even very slight movements of the chin, sometimes when the mouth is opened only very slightly (1 or 2 cm.) The difficulties in mastication are considerable. The condition is not a true dislocation, but results almost in immobility of the jaw.

Static dislocations are permanent and continuous. Even in a state of repose (occlusion), the mandibular condyle, because of various conditions (fracture or excessive size), occupies a position more anterior than normal, a position corresponding to a slight gaping of the jaws.

Dynamic dislocations include fixed, artificially reducible dislocations and non-fixed, physiologically reducible dislocations. They may be unilateral or bilateral, but are more frequently bilateral. They are rarely congenital, almost always acquired. The term artificially reducible means that reduction requires manual intervention with or without muscular action by the patient. The term physiologically reducible means that reduction may be effected by the patient by merely relaxing one set of muscles and simultaneously contracting another set.

Only very few cases of congenital fixed dynamic dislocation have been reported (Smith Wilcox). The acquired type is usually a simple traumatic dislocation which is easily reduced by the classical manual maneuver. However it may be irreducible from the beginning or become irreducible secondarily. Under such circumstances surgical intervention and meniscectomy are the procedures usually employed.

Even after proper reduction these traumatic dislocations have a tendency to recur. Some of them recur only two or three times during life whereas others recur several times a day. The authors designate the former as "repeated dislocations" and the latter as "recurrent dislocations."

The non-fixed dynamic dislocations which are physiologically reducible have been designated by a confusing variety of names. The authors suggest calling them habitual non-fixed dislocations or habitual physiologically reducible dislocations. They may be unilateral, but are much more commonly bilateral. They are not infrequent in adults. In a review of the literature the authors found the report of only one congenital case of this type. They do not know the frequency of congenital cases, but state that they have observed the condition in several children from seven to eight years of age.

The kinetic dislocations are functional because they occur during the course of normal movements. They may be unilateral or bilateral. They are pseudoluxations occurring independently of the respective position of the bony surfaces. In other words, they are meniscal dislocations. This group includes Cooper's subluxations, which are fixed, kinetic, artificially reducible dislocations, and also the non-fixed physiologically reducible dislocations. They correspond to an abnormal displacement of the intra-articular meniscus during movements of the condylar head. This pathogenic definition should exclude dislocations proper but the intra-articular site as well as the symptoms and treatment induce the authors to include the latter.

In subluxations the jaw is fixed in a position of slight opening and reduction is often quite easy by slight pressure on the chin or contraction of the muscles of adduction by the patient. Most surgeons agree that in all of these kinetic dislocations the best results are obtained by meniscectomy or meniscotomy.

Physiologically reducible dislocations may suddenly become fixed and require artificial reduction. This change may be explained by hyperdistention followed by retraction of the posterior meniscal ligament capable of displacing the meniscus backward and thus causing fixation.

There is also a type of meniscal dislocation which is reduced spontaneously. For the condition responsible for this dislocation the term "meniscitis," first used by Lana, seems appropriate.

Among the static dislocations due to trauma are dislocations following high subcondylar fractures with or without consolidation. In fractures of this type the condyle is drawn by the external pterygoid forward and inward. It remains within the articular capsule but is in an abnormal position. When the fracture does not consolidate there develops a subcondylar pseudarthrosis which is physiologically satisfactory. When the fracture consolidates, the condyle remains in an abnormal position but develops satisfactory function in this position because of the anatomical reserve which Sæbøen has described as being of great importance in the temporomaxillary articulation. In this group belong also the static dislocations secondary to lesions of the soft tissues of the face and neck without bone involvement such as fibrous adhesions, muscular contractions and retractions or pithelism.

The non-traumatic group of static dislocations are unilateral dislocations with lateral deviation of the mandible. They are associated with hypertrophy of the condyle which is not confined into the glenoid cavity. The nature of the epiphyseal hypertrophy remains obscure.

In conclusion the authors state that anomalies of dental apposition may cause condylar slipping. In aged persons who have lost their teeth the condyle is always more anterior than normal.

EXCERPT 5. ALMOES.

EYE

Benedict, W. L. Retrobulbar Neuritis and Disease of the Nasal Accessory Sinuses. *Arch Ophth* 1933 ix, 593

Much has been written on the anatomical position of the fibers of the optic nerve and their relation to the nasal accessory sinuses which gives the impression that disease of the sinuses or changes in their structural development have a direct bearing on the function of the optic nerves through continuity. The anatomical variations in the sinuses permit a variety of relationships between the sphenoid and ethmoid cells and the nerve in its passage through the optic foramen and on to the chiasm. It has been intimated that disease of the mucosa of the accessory sinuses may be transmitted to the optic nerve by direct extension or by the diffusion of toxic material along the blood vessels traversing the region.

However, the effects on the optic nerve of disease of the nasal accessory sinuses have not been established. In the explanation of involvement of the optic nerve by infection of the sinuses contiguous to its course more stress has been laid on the presence of infection in the sinuses or hyperplasia of the sinus mucosa than on pressure on the optic nerve by the walls of the sinus or by constriction of the optic foramen. In spite of the fact that changes in the visual field are not often found in rather extensive diseases of the sinuses, in cases of retrobulbar neuritis the rhinologist is often urged to operate on ethmoid and sphenoid sinuses in which he can discover no disease.

When the vast number of cases of severe suppurative sinus disease without visual symptoms is considered, a relationship between sinus disease and retrobulbar neuritis becomes much less credible. Even in the presence of dehiscences in the bony walls in either acute or chronic disease of the ethmoid and sphenoid cells lying near the optic nerve the incidence of visual disturbances in patients seen in the Mayo Clinic is negligible. The transmission of inflammation from the sinuses to the optic nerve by direct extension, through the blood or lymph stream or by toxins emanating from slightly thickened mucous membranes and diffused as noxious vapors has received no convincing experimental proof. Most authorities are agreed that multiple scleroses accounts for the greatest number of cases of retrobulbar neuritis.

Of 225 cases of retrobulbar neuritis seen at the Mayo Clinic, the cause was found to be multiple sclerosis in 155, pernicious anemia and nicotine in 14, diabetes in 14, alcohol and tobacco in 28, syphilis in 2, congenital amblyopia in 4, familial causes in 1, sinus disease in 1, postpartum hemorrhage in 1, plumbism in 2, and an indeterminate factor in 3.

In comparing treatment by means of foreign protein with operation on the sinuses, it is evident that the improvement obtained is due to the same factor. It has been shown that the injection of typhoid vaccine materially increases the peripheral circulation

The resulting improvement in the circulation of the nerve restores the function of the nerve. The same effect can be produced by other means such as the application of a 2 per cent iodine solution to the nasal mucosa, the administration of nitrites, pilocarpin, or other vasodilating agents, and the induction of sweats.

Operation on the nasal sinuses has two effects which have not been fully taken into account by those who advocate such treatment for retrobulbar neuritis. Packing of the nose with cocaine and epinephrin for anesthesia produces, first, ischemia and then congestion of the membranes. Following the operation there is continued congestion of the mucosa of the sinuses and the adjacent tissues until healing is complete. If the operation has been sufficiently extensive, there is commonly a rise in the temperature of 1 or 2 degrees F from the absorption of blood which in effect is autovaccination. These two effects are similar to those produced by injections of foreign protein. The author believes that improvement following operation is due less to the drainage of secretion from the paranasal sinuses than to the hyperemia caused by the packing and the reaction to the operation and the inoculation by absorption of blood. This theory is supported by the course of many patients after operation. Operations on the sinuses are followed by quick improvement but often relapses occur soon because the hyperemia has not continued long enough. By applying a 2 per cent iodine solution to the nasal mucosa or packing the nose 2 or 3 times daily with mild silver protein and allowing the packs to remain in place for three hours hyperemia can be induced for a longer time. This treatment is reported to be as effective as operation on the sinuses.

Except when it is possible to establish a diagnosis of suppurative disease of the sinuses definitely the author believes that advising an operation on the sinuses is unwarranted in any case of retrobulbar neuritis. If a suppurative disease of the sinuses is obviously present, operation should be performed for relief of the local condition and additional measures should be employed to relieve the retrobulbar neuritis, for even in the presence of infection of the sinuses one cannot be sure that some other factor is not present. In most instances operations on the sinuses probably do little harm and in many cases they do some good. The chief objection to them lies in the use of an adequate and unwarranted procedure when better methods of treatment are available.

Samuels, B.: The Significance of Specific Infiltration at the Site of Injury in Sympathetic Ophthalmia. *Arch Ophth* 1933 ix, 540

This article is based on the examination of 101 eyes with sympathetic ophthalmia. In all but 7 of the cases specific infiltration was present also in the other eye. In a study of the site of the injury which as a rule was near the limbus the area was usually found more inflamed at this site than elsewhere. In most of the small number of cases to which the uvea

was more inflamed elsewhere than at the site of the injury only 1 or 2 slides were available for study.

In Samuels' opinion the greater inflammation at the site of the injury indicates that sympathetic ophthalmia is due to an infection rather than an allergy and is caused by an organism entering an opening in the eyeball. THOMAS D. ALLEN, M.D.

Globus, J. H.: Tumors Affecting the Optic Chiasm and Optic Tracts: A Brief Critical Survey of Their Clinical and Anatomical Features. *Arch Ophth* 1933, 12, 730.

Chief among conditions of the central nervous system causing visual disturbances are epidemic encephalitis, multiple sclerosis, syphilis, and intra-cranial tumors.

In cases of intracranial tumor the first sign observed by the ophthalmologist is apt to be papilloedema. The rate at which the papilloedema develops and the degree to which it advances may throw some light on the location of the tumor. In cases of tumor of the posterior fossa arising in the cerebellum, the region of the quadrigeminate plate, or somewhat more forward in the interpeduncular space in the third ventricle, papilloedema appears early, advances rapidly and reaches a degree exceeding that usually noted in cases of tumor in a more anterior situation.

Disturbances of acuity of vision and particularly in the fields of vision are common in tumor of the brain, and perhaps more frequent than is generally realized. There are several crucial points in the optic system where an interruption will result in fairly typical visual disturbances. Such disturbances when associated with signs of involvement of contiguous parts of the brain give rise to the following syndromes: (1) prechiasmal (2) chiasmal (3) suprasellar and (4) intrasellar (5) temporal lobe, (6) occipital lobe, and (7) quadrigeminate plate.

Primary gliomata of the optic chiasm are exceedingly rare. The general region where the tumor is situated may be determined from the ophthalmological findings. The tumor may be distinguished from other lesions by: (1) absence of changes in the sella turcica, (2) absence of calcium deposits in the suprasellar region, (3) the possible presence of other manifestations of von Recklinghausen's disease (4) early primary optic atrophy with the occasional superimposition of papilloedema, (5) rapid progressive loss of vision associated with a unilateral temporal defect, and (6) a peculiar lateral outline of the anterior part of the sella which gives the impression of a bulge under the anterior clinoids, but is due to enlargement of the optic foramina. Surgical intervention is not successful.

Tumors of the craniopharyngeal duct are teratoid and may be regarded as autochthonous teratomata. Among the symptoms appearing most often in pre-adolescence are manifestations of dysfunction of the sympathetic nervous system—polydipsia, polyuria, sexual and skeletal infantilism, adiposity and hypoparathyroidism. When these are associated with bitemporal hemianopsia, involvement of the oculomotor

nerves, and deposits of calcium in the suprasellar region without deformity of the sella turcica, they point definitely to a tumor of the craniopharyngeal duct in the interpeduncular space. The results of operation are best in cases of small thin-walled cysts. Evacuation with partial or complete removal of the cyst wall has often yielded brilliant results. In cases of solid craniopharyngioma the operative risk is high. Surgical intervention promises little for restoration of normal vision.

The suprasellar meningioma occurs in middle age and is characterized by primary optic atrophy, bitemporal hemianopsia or a tendency toward that condition, non-involvement of the sella turcica, and, occasionally, a calcium speckling in the suprasellar region. Of all tumors involving the chiasm, suprasellar meningioma is the most favorable for operation.

Suprasellar hypophyseal adenomata occur most frequently in middle age and may be associated with bilateral optic atrophy and bitemporal hemianopsia. They may cause no distortion of the sella. As the hypophysis is unaffected, there are no hypophyseal symptoms. A homonymous hemianopsic defect on the right side is not inconsistent with a hypophyseal adenoma. The initial visual disturbance may consist of a small unilateral temporal defect, but instead of developing into typical bitemporal hemianopsia the tumor may cause a homonymous defect by involving one of the tracts. Binasal hemianopsia is a more uncommon field defect. In the treatment, by far the most satisfactory results are obtained by operation. High voltage roentgen or radium therapy may occasionally cause improvement, but does not arrest the pathological process.

Lesions of the temporal lobe, when not accompanied by such localizing signs as uncinata seizures, visual hallucinations, or typical speech disturbances, are often very difficult to diagnose. When the lesion is situated in the left hemisphere the temporal anomaly may be the deciding factor in its localization. When the lesion is in the right hemisphere, the focal signs may be so meager that they give no clue to its position. A knowledge of the course and distribution of the geniculocalcarine fibers is of great aid. Cushing focused attention on the so-called Meyer loop which plays an important part in the causation of a partial or so-called quadrantic type of hemianopsic defect. This visual distortion may often be the only decisive diagnostic sign.

The most characteristic sign of a tumor of the occipital lobe is homonymous hemianopsia, particularly when it is an isolated finding. Visual defects are frequent also in cases of tumor of the temporal lobe. Of much greater significance is the character of the hemianopsic fields. The character of hallucinations may occasionally aid in the localization of the lesion. The unformed type is characteristic of occipital lobe tumors, whereas the formed type is more common in temporal lobe lesions. In cases of neoplasm of the left occipital lobe, localization is less difficult as the hemianopsia is often associated with

optical aphasia and word blindness merging into alexia. In these, as in cases of postgeniculate lesions preservation of the pupillary reflexes is of aid.

The quadrigeminal plate syndrome is characterized by paralysis of upward gaze, skew deviation, and Argyll-Robertson pupils. These phenomena may be traced to a disorder in this part of the optic pathway. Expanding lesions of the type known as "pinealomata" often grow forward into the supratentorial region, thereby involving some part of the optic tract and giving rise to hemianopic defects.

LESLIE L. MCCOY M.D.

Evans, J. N. The Scotometry of Retinal Edema. *Am J Ophth.* 1933 xvi, 417.

The author shows by numerous typical charts that, by the use of a small target blind areas of various sizes, shapes, and patterns may be outlined in cases of retinal edema, and that these blind areas change their shapes with changes in the edema.

He emphasizes that greater care should be taken in the study of central field changes and that the relationship of these changes to vascular lesions and other pathological changes, general or local, should be determined.

THOMAS D. ALLEN M.D.

MacMillan, J. A., and Cone, W. V.: Solitary Neurofibroma of the Orbit. *Arch. Ophth.*, 1933 3, 51.

From a very careful and thorough study of the specimen in the case reported in this article the authors concluded that the tumor was a neurofibroma of the von Recklinghausen type. In the literature they were able to find the reports of only five similar tumors.

LESLIE L. MCCOY M.D.

EAR

Rosenwasser, H. and Druess, J. G.: Zygomatic Infections as a Factor in Otic Complications. *Arch. Otolaryngol.*, 1933 xvii, 625.

Six cases of infection of the zygoma associated with otitis are reported. In four, the symptoms became evident after mastoidectomy. In one they were present prior to the operation, and in one there was no gross clinical evidence of the condition, the diagnosis being made at postmortem examination.

The authors believe that a more definite comprehension of the anatomy of the zygomatic process of the temporal bone will aid the operator in following the disease process into the posterior and anterior roots to the limit and thus enable him frequently to forestall many of the late complications namely malunion, persistent postauricular fistula, epidural abscess, abscess of the brain, and meningitis.

JAMES C. BRASWELL, M.D.

Kopetzky, S. J.: Problems Concerned with Empyema of the Petrous Apex. *Arch. Otolaryngol.* 1933 xviii, 47.

Suppuration of the petrosal pyramid in pneumatized bones is a complicating lesion of purulent

otitis media and occurs in an acute and a chronic form. In the acute form a generalized leptomeningitis develops if the condition is not relieved. In the chronic form a fistulous tract develops and the pus escapes as a persistent otorrhea. Meningitis does not necessarily occur and in a few instances final healing results without additional surgical intervention.

The author's technique is advocated only for the drainage of pus from the apex in cases of encapsulated empyema in pneumatized pyramids without a demonstrable fistula. This technique is adequate because the petrous apex is reached without exposure of the endocranium. It is the author's method of choice because its results are satisfactory, it is not disfiguring, it permits tapping of the apex in the shortest possible time, and it does not cause injury to the facial, cochlear or carotid artery.

GEORGE R. MCAULIFF M.D.

NOSE AND SINUSES

Hilding, A. Experimental Surgery of the Nose and Sinuses. III. Results Following Partial and Complete Removal of the Lining Mucous Membrane from the Frontal Sinus of the Dog. *Arch. Otolaryngol.*, 1933 xvii, 760.

The author states that when the normal frontal sinus of the dog is denuded of mucous membrane and the scalp is sutured over it without drainage, the sinus usually fills with scar tissue that obliterates the cavity.

In exceptional cases there is partial restitution of the sinus with regeneration of the lining epithelium.

Under some circumstances there is formed a smaller cavity with walls composed of thick, white connective tissue devoid of epithelial covering over which epithelium apparently cannot grow. This connective tissue shows no sign of inflammation even if it is exposed to the air.

Under other conditions epithelium will grow over the heavy scar tissue. In some instances it appears to lie directly on the scar tissue and in other instances on vascular submucosal tissue.

If portions of epithelium are left within the sinus, cysts filled with mucin form within the obliterating scar.

JAMES C. BRASWELL, M.D.

MOUTH

Wangenstein, O. H., and Randall, O. S. Treatment and Results in Carcinoma of the Lip. *Am J Roentgenol.*, 1933 xix, 75.

A number of studies have shown that when the submaxillary and submental lymph nodes are routinely removed in early cancer of the lip metastatic involvement is found on microscopic examination in only about 25 per cent of the cases. As compared with cancer of the breast or tongue, carcinoma of the lip is more benign and does not form lymph node metastases early with equal regularity. Nevertheless the results of simple V excision and the

complete operation are so striking as to indicate that adequate treatment of the lymph nodes is of importance.

In the authors opinion, palpation and gross examination of the removed nodes are almost as reliable as microscopic examination for the detection of lymph-node involvement.

When the lymph nodes are evidently involved roentgen therapy alone is futile. According to the authors experience, the most effective treatment under such circumstances is surgical extirpation of the involved lymph nodes combined with the interstitial use of radium emanations (gold seeds).

In cases in which the excision of the lesion has caused considerable narrowing of the oral opening, the authors have found that a lateral incision on one or both sides is usually sufficient to correct the deformity.

The results of treatment of cancer of the lip compare favorably with those of the treatment of any other malignancy. Failures are due usually to delay of adequate treatment.

In a series of 130 cases there were 34 deaths, a mortality of 26 per cent. In 26 (20.7 per cent) death was due to cancer or a cause associated with the treatment of the lesion. The treatment consisted of surgery supplemented by roentgen or radium irradiation. In the authors opinion surgical removal of the submaxillary lymph nodes affords the patient with an early lesion more protection than conservative irradiation. JOSEPH K. NARAY, M.D.

Land, C. G., and Holton, H. M.: Carcinoma of the Lip: Report of Results of Treatment at the Collis P. Huntington Memorial Hospital from 1918 to 1926. *Am J Roentgenol* 1933 XXX, 59.

In the last twelve years over 12,000 cases of cancer have been seen at the Huntington Memorial Hospital, Boston. In the last four years of the period from 1918 to 1926 there was a tendency to do less radical operations and to treat a larger proportion of the patients surgically.

The authors conclude that there is no justification for not considering the pathological grading of a tumor as an important aid in the choice of treatment, but believe that perhaps it should not be stressed as strongly as the size and duration of the lesion.

Small lesions without deep ulceration or infiltration and without enlargement of the glands of the neck may be safely treated by local treatment alone. They are usually of Grade 1 and of comparatively short duration.

The best local treatment of small lesions is adequate surgical excision. The authors approve also of adequate irradiation treatment following biopsy. By "adequate irradiation" they mean doses of from 500 to 1,000 mc.-hrs. of radium with considerable filtration for small lesions and larger doses for larger lesions.

In all other cases up to the limits of reasonably safe operability a submental neck dissection should

be done whether the local lesion is treated with radium or surgery.

In most cases in which a neck dissection has been done at least 900 r of high-voltage roentgen therapy should be given to each side of the neck and this should be repeated if the glands in the neck are positive for carcinoma.

Cases of fixed, deep, or large masses in the neck should be treated by irradiation for palliation.

Every case must be studied individually. In some instances it may be necessary to give less than the optimum treatment because of the patient's age, the presence of some other disease, or a poor general condition. JOSEPH K. NARAY, M.D.

Fabriziani, M.: Report on the Activity of the Surgical Clinic of the Charcov Stomatological Institute (Bericht ueber die Tuetigkeit der chirurgischen Klinik des Charkower stomatologischen Instituts). *Soviet Stomat* 1933 47.

During a period of nine months the Charcov Stomatological Institute served 593 in-patients and 3,560 out-patients. The author selects for comment some of the cases treated in the in-patient department.

Among the numerous cysts there were 2 which were multilocular and 2 which occupied almost the entire upper jaw. All of the cysts, even those with suppuration, were carefully cleaned out and then sutured with compression of the mucous membrane flap to the wall of the bony cavity.

Of the 3 patients with chronic sepsis of odontogenic origin, 1 died with the signs of increasing anemia and a leucocytosis in spite of complete removal of the osteomyelitic focus in the lower jaw and the beginning formation of granulations.

Among the cases which were more difficult from the operative standpoint were 4 in which resection of the upper jaw was done (in 1 for carcinoma and in 3 for sarcoma) and 3 in which the lower jaw was resected (in 2 for carcinoma and in 1 for sarcoma). Two of the resections of the upper jaw were preceded by ligation of the external carotid artery.

Eleven patients with true ankylosis of the lower jaw were operated on by the method of Rochet, Schmidt, or Bockenbeim with the interposition of a flap of the masseter after osteotomy or resection of the capitellum. In 1 case mobilization was achieved after ankylosis of twelve years' duration following a severe gunshot injury.

In 7 cases of cleft palate operation yielded as excellent anatomical result, but there was no opportunity to give the patients phonetic instruction.

In 16 cases in which a plastic operation was performed on the jaw there was only 1 failure. The failure was due apparently to the fact that the operation was performed in a single stage.

Of 4 cases admitted to the clinic with the diagnosis of trigeminal neuralgia, fibrous osteitis of the lower jaw was found in one and the roentgenogram and the cut surface of the extracted healthy tooth showed a denticulus in the other.

Of the 46 fractures (some of them multiple), 30 were treated as in-patient cases. As a rule older fractures were not splinted immediately treatment first being given to arrest the osteomyelitic process. Normal position was obtained exclusively by means of rubber bands fastened to retention hooks on wire splints on the upper or lower jaw Klingardt's apparatus with moderate rubber traction was used only in a case in which the fragments had grown together in an abnormal position. Consolidation of fractures was accelerated by thyroïdin.

In cases of osteomyelitis (6 of the upper jaw and 54 of the lower jaw) the attempt was made to provide for external escape of the pus. In this way it was possible to save the teeth in 3 severe cases.

Within a short time the Clinic has become the consultive center for Charkov. In the author's opinion every large hospital should have a stomatological surgical division. M. HERSZ (Z)

Bernard R : The Facial Route in Extensive Operations on the Mouth and Oropharynx; Cancer of the Mandible, Floor of the Mouth, Tonsil, and Pharynx (*Le décollement des téguments de la face. Voie d'abord dans les grandes opérations d'extirpation de la bouche et l'oropharynx: cancers du maxillaire inférieur, cancers du plancher de la bouche, cancers de l'amygdale et du pharynx*) *Pratt méd. Par.*, 1933, 21, 748

In the classical operations on the oropharynx the operative field was approached by way of the neck. This approach has the following disadvantages:

- 1 It is indirect and inconvenient.
- 2 The septic buccal cavity communicates with the cellular spaces of the neck.
- 3 There is much mutilation of the bone.

In the method described by Bernard the approach to the lesion is much more direct, the spaces of the neck are not opened, and there is often little mutilation of the face. A vertical incision is made through the lip and chin to meet a transverse incision made along the mandible. Wide exposure of the mouth is then obtained by dissecting the flap free on each side of the mandible. In some cases total resection of the mandible may be necessary but this is avoided whenever possible. In many cases the surgeon may preserve the function and appearance of the face by limiting the operation to what is described as an "economical resection." In this procedure the bone is only partially resected, usually toward the alveolar margin in the horizontal body of the bone or the anterior portion of the mandibular ramus. If the field of operation is unilateral, the turning back of a single flap of skin from the chin will be sufficient for resection of the mandible on the affected side and will afford a good approach to the tonsil and pharyngeal wall of that side. MARRS W. POOL, M.D.

Gentili F : Cancer of the Tongue (*Sobre o cancro da Língua*) *Arquivo de patol.*, 1931, 31, 148.

The author reviews the history of the treatment of cancer of the tongue from the days in which sur-

gery alone was used through the period of roentgen treatment which proved ineffective up to the present time, when combined surgical and radium treatment is employed. He discusses the local causes of cancer of the mouth in general and the relations between tobacco and syphilis and cancer of the tongue, and emphasizes the importance of buccal and dental hygiene, the removal of causes of irritation, and the extirpation of precancerous conditions, particularly leucoplakia, in the prevention of cancer of the mouth and tongue.

Since 1913 he has treated cancer of the tongue by a modification of radium puncture. He makes openings in the tongue with the radiobistoury for the insertion of the radium tubes. If the tumor is not more than three or four weeks old he applies radium externally by means of a Columbia paste apparatus according to Regard's technique. If the tumor is older or if its age and the degree of involvement of the glands cannot be determined, he routinely removes the suprahyoid cervical glands on one or both sides. He states that cancers of the posterior two-thirds of the tongue produce early bilateral involvement of the glands. Extirpation of the cellular tissue and glands does not exclude postoperative cervical radium therapy.

There is no form of cancer capable of greater variations than cancer of the tongue. The lesion may develop toward the floor of the mouth or follow the lymphatics and invade the jaw. In either case the tumor may be treated by radium puncture and the glands treated by the external application of radium or surgical removal depending on the stage of their involvement. If the cancer is so far advanced that only palliative measures are possible the lingual or external carotid arteries may be ligated and as much of the tumor mass as possible removed with the radiobistoury. Sometimes roentgen therapy is employed as palliative treatment but it is not very effective.

In the removal of the glands it is best to avoid the formation of a communication between the cervical and buccal fields. If enlargement of the field of operation is necessary it is best to make a horizontal section of the cheek from one of the commissures. The steps of the operation are shown in illustrations. The author prefers rectal or intravenous anesthesia even if it must be supplemented with local anesthesia. AUDREY GOSS MORGAN, M.D.

Tallini F. C.: The Technique of Radium Treatment of Carcinoma of the Tongue (*La tecnica curatologica del carcinoma della lingua*) *Radiol. med.* 1933, 21, 625

The author describes the methods of applying radium therapy in cases of cancer of the tongue which are used in the Radiological Section of the National Institute Víctor Emanuel III for the Study and Treatment of Cancer at Milan. Ordinarily the treatment is divided into the following three stages: (1) fixation of needles and small radioactive tubes in and around the tumor; (2) surgical

removal of the regional lymph glands and (3) irradiation through the skin of the regional lymphatic territory by means of an apparatus moulded of Columbia paste.

Also discussed are the general principles of radium puncture, including the selection and space distribution of the needles or tubes, the technique, and the duration of the treatment. The plans used in different cases according to the stage of development and the localization of the tumor (shown also in illustrations) and postoperative irradiation with the Columbia paste apparatus, including the technique, the construction of the apparatus, the dosage and the duration of the treatment in different cases.

ALBELY GOM MORAY, M.D.

PHARYNX

Gordon Taylor C: Malignant Disease of the Oropharynx, Including the Fauces. *J. Laryng.* vol. 5, Oct. 1933, April 403.

For tumors of the hypopharynx amenable to surgical removal the old fashioned knife may still be used, but for the extirpation or sterilization of primary malignant neoplasms of the oropharynx the modes of attack now employed are diathermy and various forms of irradiation. The results of radium therapy have caused crudely mutilating operations to be looked upon with an increasingly critical eye. The surgery of cancer of the oropharynx requires much judgment. For the best results the surgeon must choose the method most appropriate for the particular case.

The author discusses in detail the different forms of cancer of the oropharynx, describes the operations of approach for convenient extirpation of the primary tumor, and reviews the methods and results of other surgeons.

GROVER R. McLENNAN, M.D.

Gordon Taylor C: Patterson, A., Stahlin, J., Van Den Wittenberg, L., Vanillella, H. C., and Others: Discussion on Malignant Disease of the Oropharynx, Including the Fauces. *Proc. Roy. Soc. Med. Lond.* 1933, vol. 26A.

CHRISTIAN TAYLOR believes that for malignant neoplasms of the pharynx and fauces diathermy and irradiation should be the modes of attack. He states that the results of radium therapy have made him look with an increasingly critical eye upon crudely mutilating operations. The surgery of cancer in this region is often judgment as each case presents an individual problem.

ASSERUM reported that he had treated a case of epidermoid carcinoma with lip but in selected cases he does an embolization of the tumor and gland heating as a mode of irrigation. He personally, in just one case, removed the tumor.

MAI VAN DEN WITTENBERG believes that it is a mistake to give too much of the external irradiation to the tumor and that the best method is to give by external irradiation

metastases of epithelial cancers are more resistant than the primary lesions, it is advisable to operate when possible and irradiate the whole region dissected later. The percentage of cures is small. The results of irradiation may sometimes be improved by the use of lipoid, extracts of brain, thymus, bone marrow and spleen. Another agent used is a small amount of barium by mouth.

TROTTER said that he favors median pharyngotomy for the radical cure of growths which are situated fairly far down the pharynx as it spares the patient mutilation.

HARMER stated that in cases of rapidly growing sarcomata surgery and diathermy are attended by grave risks, whereas the tumors respond well to irradiation. In early carcinoma of the lip and anterior portion of the tongue the growths generally disappear if they are surrounded with radium. In this region surgery also gives good results. In cases of deep growths irradiation is given externally and also by interstitial irradiation.

DICKER reported that he still performs a serious and mutilating operation as his experience with other methods has been disappointing.

WATT stated that the results are most satisfactory in cases of postoperative recurrence. In such cases surgery or radium irradiation or both are indicated.

McLENNAN reported that he had cured eleven primary growths by diathermy with very good results.

JOSSON cited twenty-eight cases of malignant disease of the pharynx. In twenty-two, the lesion was in the oropharynx. The treatment consisted of diathermy followed in some cases by irradiation with the X-rays or radon.

GROVER R. McLENNAN, M.D.

Patterson, A.: Malignant Disease of the Oropharynx, Including the Fauces. *J. Laryng.* 5 Oct., 1933, April 473.

The author states that with comparatively recently the results of treatment of malignant disease of the oropharynx have really been extremely poor, but since the introduction of diathermy many successful results have been obtained. With regard to radium irradiation he states that while an almost perfect cure of a tumor often takes place, it is frequently followed by a recurrence, per place, it is frequently associated with the dissemination even if in the case of an attempt is made to place the radium surrounding the tumor. On account of the amount of work that is being done to improve the X-ray treatment, Patterson

is able to hope that in future entirely by irradiation from units of radium and extremely being observed and checked.

Patterson holds the view that if there is a good chance of removing the tumor completely without undue risk endothermy excision should be carried out and in selected cases combined with drastic surgical removal of the gland-bearing areas. Probably in the majority of cases irradiation should follow operation. Before the use of endothermy the usual precautions should be taken to render the mouth as clean as possible. To insure eradication, the healthy tissues must be severed at a sufficient distance from the growth. After removal of the tumor the resulting cavity should be treated with a button electrode. Adequate exposure can be obtained in every case by the use of the Davis gag or suspension apparatus. In Patterson's opinion, splitting of the cheek does not improve access to the tumor, and such a procedure as removal of a portion of the lower jaw which increases the operative risk and leads to deformity is necessary only in exceptional cases.

Operation may be contra indicated by the size or situation of the primary tumor, the age or general condition of the patient, or the presence of glandular masses which cannot be removed. The ultimate outlook depends upon the presence or absence of metastases. Occasionally, however, a sufficiently thorough operation will be successful even when there are massive metastases in the glands.

JAMES C. BRISWELL, M.D.

NECK

Turton, P. H. J.: The Distribution of Simple Gout in Derbyshire. *Proc Roy Soc Med Lond.*, 1933 xxvi 1223

Following a discussion of the physical character, altitude, temperature, rainfall, drainage, soil and source and nature of the water supply of Derbyshire, the author reports the results of an investigation of the incidence of the different types of simple gout with regard to the region, minerals in the soil, iodine content of the water and diet and education of the subjects. He concludes that the endemic gout of Derbyshire is not due to a single agent. Impure and unprotected sources of water supply leading to a possibly specific gastro-intestinal infection are important factors in the production of the disease. The chief faults found in the diets of the children were a frequent total absence of fresh vegetables and fruits, the substitution of margarine or vitamins poor fats for butter and insufficiency of meat and milk. There was no evidence that iodine insufficiency was a factor in the causation of the gout. Turton believes that attention to public and personal hygiene, to the principles of nutrition, and to the mineral content and purity of the water supply have all played a part in abolishing or diminishing the frequency of 'Derby neck.'

M. HERBERT BARKER, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Dandy W. E.: *Physiological Studies Following Extirpation of the Right Cerebral Hemisphere in Man. Bull. Johns Hopkins Hosp. Balt. 1913, III, 31.*

Physiological studies were made on three patients following removal of the greater portion of the right cerebral hemisphere.

The first patient was a preacher thirty two years of age who had a large subcortical tumor involving the right frontal, parietal, and temporal lobes. Seven weeks after exposure of the tumor and decompression, the right cerebral hemisphere with the exception of an area of the occipital lobe was subtotally resected, 250 gm. of brain tissue being removed. The postoperative course was uneventful. The patient a mental faculties appeared to remain quite normal. Death occurred two years and two months later apparently from a recurrence.

The second patient was a woman twenty four years old who had a deep infiltrating tumor in the face and arm center of the right cerebral hemisphere. Following elevation of the frontal lobe and double clipping of the carotid artery alongside the optic nerve, the anterior cerebral, middle cerebral, and posterior communicating arteries were doubly clipped and divided. Thereupon the volume of the cerebral hemisphere was immediately markedly reduced. Three hundred and seventy five grams of brain tissue were removed. Following continuous drainage, instituted on the third postoperative day in the frontal region, infection developed. The infection became quite purulent and drainage through an incision with removal of the bone flap became necessary. The infection could never be eradicated. Death occurred six months after the operation. The patient's mentality was apparently fairly good but at times she was irritable and uncooperative.

The third patient was a colored man from whom 534 gm. of the right cerebral hemisphere containing a tumor were removed. Meningitis developed on the second day and death occurred ten days later. Conversation carried on after the operation indicated normal mental function.

The author discusses the retention of mental function after such radical resections. One of the most interesting findings was the preservation of the function of the cranial nerves. Hemianopia was complete. The function of the trigeminal and facial nerves was only slightly altered. In one of the cases reported sensation was slightly diminished over the trigeminal distribution. The motor power of the facial nerve was definitely diminished, but remarkably well preserved. Very slight movement of the

left leg was preserved, and contractures did not develop. The flaccidity of the extremities was most surprising. The preservation of sensation in the joints and acute pain when the deep muscles were compressed demonstrated the existence of sensations that are mediated at a lower level than the cortex. The abdominal and corneal reflexes remained unchanged.

ROBERT ZOLLINGER, M.D.

Hirsch O.: *Nasal Operations for Tumor of the Hypophysis (Die nasalen Operationen der Hypophyseantumoren) Klin. Monatsbl. f. Augenheilk. 1932, LXIV, 752.*

The author reviews 237 nasal operations on the hypophysis which were performed in the cases of 233 patients. Of 175 patients operated upon in the period from 1919 to 1932 9 died the operative mortality being therefore 5.1 per cent. Of the patients who survived the operation, 27 died in the first three years. Of these, 15 died of an inoperable tumor 3 of secondary intracranial operation 2 of apoplexy 2 of cerebrospinal fluid fistula 1 of hemorrhage 1 of grippe and 3 of an unknown cause. Two patients died after three and a half years 5 after six years (2 of these from recurrence) 3 after ten years and 1 after twelve years. One hundred and thirty-one of the patients are still living.

Of the 46 patients who are still living from eight weeks to two years after the operation, 32 have good end-results, 10 have not been benefited, and 4 have recurrences. Of the 28 who are still living after from two to four years, 28 have good end-results, 6 have not been benefited and 1 has a recurrence. In the cases of 3 the results are unknown. Of the 57 patients who are still living after from four to thirteen and a half years since the operation, 41 have good end-results, 5 have recurrences, and 2 have not been benefited. The results in the cases of 9 are not known.

The prevention of recurrences demands after treatment with radium. The figures cited show the results of combined operative and radium treatment.

Seventy per cent of the patients operated on from four to thirteen years ago are clinically cured and are excellent examples of improvement and preservation of vision following operation.

In most of the cases reviewed the operation was performed because of progressive disturbances of vision, and in a few because of acromegaly with unbearable headaches. The method described is suitable for cystic and intrasellar solid tumors. Malignant and very large tumors which have broken through into the sphenoid sinuses are not treated successfully by any method. The author

reports the case of a woman whose vision was fair twenty years after operation although it was not good at the time of the intervention. POLTA (2)

Smith A. B., Lambert, V. F. and Wallace, H. L.: Paralysis of the Recurrent Laryngeal Nerve. A Survey of 235 Cases. *Edinburgh M. J.*, 1933, 21, 344.

The authors report a study of 235 cases of paralysis of one or both recurrent laryngeal nerves. Cases showing intrinsic pathological changes in the larynx, such as tuberculous or specific ulcerations, were excluded. The ratio of males to females was 2:2:1. The causes of the paralysis varied greatly. In 23 cases no definite cause could be found. In 7 cases the condition followed exposure to cold, and in 45 the cardiovascular system was apparently the causative agent. In 5 of the latter there was a definite cardiac lesion without involvement of the aorta. The authors suggest the possibility that dilatation of the left aortic root from mitral stenosis might produce paralysis of the left recurrent laryngeal nerve. In 23 of the cases reviewed, the majority those of males, the paralysis was the result of pulmonary tuberculosis. Of 30 cases in which it was due to goiter trauma at operation was a factor in 12. The incidence of the condition was highest in cases of tumor. In 18 cases the cause was enlarged glands in the neck, and in 15 cases, a disease of the nervous system such as bulbar paralysis.

In 23 (9.8 per cent) of the cases the paralysis was bilateral. The left side was involved much more frequently than the right except in cases of goiter, in which the right and left nerves were affected with equal frequency.

The authors discuss Semon's law according to which the cord is in the median line position in the early stages of paralysis but moves outward and occupies the cadaveric position when the paralysis becomes complete. From an investigation of the position of the cord in 117 of the cases reviewed, the authors conclude that the cadaveric position is assumed by paralyzed cords in the majority of cases and that, irrespective of its position, a paralyzed vocal cord may completely recover its function, especially when no cause for the paralysis can be discovered. The aphonia resulting from permanent paralysis of a vocal cord will ultimately show considerable improvement, and complete recovery of the voice may occur within a year.

ROBERT ZOLLINGER, M.D.

SPINAL CORD AND ITS COVERINGS

Wertheimer P., and Dechamps, J.: Acute and Chronic Epiduritis (Les épidurites aiguës et chroniques). *Lyon chir.*, 1933, 102, 129.

The epidural space between the dura mater of the spinal cord and the wall of the vertebral canal may become the site of acute or chronic inflammation. The inflammation may extend to it by contiguity from a neighboring infection or may be due to a met-

astatic abscess. The authors report two cases, one acute and the other chronic.

In the first case, that of a woman forty-eight years of age the condition developed following the spontaneous opening of an anthrax infection of the neck. The next night the patient complained of intense pain in the left arm, and the following morning showed incomplete paralysis of the legs. The incomplete paralysis was followed by complete flaccid paralysis, and death occurred on the fifth day. Autopsy showed a focus of inflammation about 2 cm. long in the anterior epidural space at the lower end of the cervical cord.

These inflammations generally occur in the posterior space and are apt to present signs of either meningitis or transverse myelitis. In spite of the difficulties in diagnosis, acute purulent epiduritis may be diagnosed on the basis of its sudden beginning, the intensity of the pain, the predominance of paralysis of the lower limbs, the rapidly progressive character of the paraplegia, and the absence of cerebral symptoms. As a rule the interval between the beginning of pain and the beginning of paralysis is longer than in the case herewith reported. The advisability of lumbar puncture when epiduritis is suspected is questionable as there is danger of carrying the infection into the subdural space. In some cases surgical decompression has yielded good results. It was not attempted in the authors' case because the diagnosis was not definite. The course of the condition was so rapid that it is doubtful whether such treatment would have been successful.

The second case reported by the authors was one of chronic tumor-like epiduritis in a workman twenty-four years of age who was admitted to hospital for paresis of the right leg and left arm. The condition had begun with intense pain in the left arm about three months elapsed before the paralysis developed. Lipiodol examination suggested a tumor at the level of the seventh cervical vertebra. Operation disclosed a chronic tumor-like epiduritis. The tissue removed was an ordinary inflammatory granulation tissue with no signs of tumor cells or giant cells. Guinea-pig inoculation was negative.

In neither of the cases reported was there a history or evidence of syphilis.

While simple laminectomy has been successful in some cases, the pseudo-tumor should be removed if possible. Roentgen treatment has proved effective in a few cases.

AUDREY GOSN MORGAN, M.D.

MISCELLANEOUS

Puusepp L.: The Development of Surgical Neuro-pathology During the Last Ten Years According to the Data of the Nervous Disease Clinic of the Tartu University at Dorpat (Ueber die Entwicklung der chirurgischen Neuro-pathologie während der letzten 10 Jahre, nach den Daten der Nervenklinik der Universität Tartu Dorpat). *Fakultätsblatt Tartu*, 1932, 21, 95.

In the Nervous Disease Clinic of the University of Dorpat surgical methods of treatment are employed

with considerable frequency. The advances which have been made during the last ten years are summarized as follows:

In spastic paralysis, the posterior nerve root is no longer divided according to the method of Foerster, but is demonstrated on freely exposed peripheral nerves by stimulation of the sensory portion and then resected.

In lesions of the brachial plexus, tenotomy of the scalenus anticus is carried out instead of resection of the first rib.

In neuralgias, injections of alcohol are employed extensively.

The author uses puncture of the spinal subarachnoid space at any level desired. The needle is 1 mm. thick. In the cervical and the lumbar portions of the spine the direction of the needle is vertical to the skin, but in the thoracic portion the needle is introduced obliquely from below upward. The depth of the puncture is from 4 to 5 cm. in the cervical portion, from 5 to 8 cm. in the thoracic portion, and from 6 to 7 cm. in the lumbar portion. The back is curved as much as possible. The needle is introduced slowly and carefully. When the flow is deficient the pressure of the spinal fluid is increased by pressure on the abdomen or compression of the jugular vein in order to remove obstructing particles of fat from the cannula. If spinal fluid is obtained below the site of obstruction of the lipiodol, the presence of circumscribed meningitis is indicated. In cases of tumor particles of the neoplasm may be aspirated. Therefore to ascertain the necessary depth of puncture it is advisable to determine this previously by exploratory puncture below the suspected border of the tumor. The author has carried out this stage puncture twenty eight times without complications. Its field of indications includes (1) the differential diagnosis between cysts, circumscribed meningitis, tumors, and other obstructions to the circulation of spinal

fluid (2) the evacuation of cysts and (3) the drug therapy of luetic processes.

The author also practices myelopuncture (thirty-two cases without complications). He introduces a 0.5 mm. needle through the spinal puncture cannula. When it penetrates the spinal cord the flow of fluid ceases and the patient feels a severe pain in one or both legs, which soon ceases. From the character and pressure of the fluids obtained a differential diagnosis can be made of intramedullary spaces. When the pressure in such spaces is excessive the procedure has a therapeutic effect. By the introduction of from 0.3 to 0.5 c. cm. of lipiodol a space may be demonstrated with the roentgen rays after from ten to twenty minutes.

Endomyelography was done in three cases. The author attributes the introduction of the operative treatment of syringomyelia to his clinic and praises the procedure. Before the intervention he always determines the borders of the space by means of endomyelography.

In the study of spinal cord tumors, Punsopp has found that there is an arachnoiditis ossificans which produces symptoms of compression and may be cured operatively.

He has learned to recognize also a thickening of the ligamentum flavum between the fifth lumbar vertebra and the sacrum which produces bladder and rectal disturbances (three cases) especially in motor car drivers, by causing compression of the cauda equina. These disturbances can be cured by removing the band.

In a case of parkinsonism the author divided the posterior columns of the spinal cord with good results.

In tabetic crises, he has obtained good results from partial chordotomy of the tracts to the thorax and the abdomen, as determined by stimulation, through a longitudinal incision in the spinal cord.

WERNER (2)

SURGERY OF THE CHEST

CHEST WALL AND BREAST

TROVATI, S. The Bleeding Breast (La mamelle saignante) *Rev de chir. Par.*, 1933 111, 313

Bleeding from the breast was formerly considered indicative of subadjacent malignancy, but is now known to be caused by benign as well as malignant conditions. It is a relatively rare phenomenon. It occurs most frequently after the age of forty years and usually in females particularly women who have borne several children.

The initiation or aggravation of the hemorrhage during the menstrual periods is explained by the congestion of the breast which occurs during menstruation.

Two groups of cases of bloody discharge from the nipple are recognized. The first group are the cases in which there is no underlying anatomopathological lesion of the mammary gland. Among these are cases of hemorrhage of the breast of hysterical origin, those of breast bleeding supplementary to menstruation, those due to local or general vascular diseases those of breast hemorrhage occurring in the presence of a blood dyscrasia, and those of bleeding from the breast in the newborn. In general, bleeding of this type is infrequent. It is due to a functional condition rather than an organic breast lesion and does not require surgical intervention.

The second group of cases are those of inflammatory benign and malignant lesions of the breast. Chronic mastitis occasionally gives rise to a sanguineous discharge. Of the benign tumors causing bleeding from the nipple, the most common are intracanalicular adenomata. These have a particular tendency to cause hemorrhage on account of their structure and their usual location within the larger ducts. Other benign tumors causing hemorrhage from the nipple are papillomata, adenofibromata, hamangiomas, and lymphangiomas. Carcinoma of the breast may be associated with a bloody discharge if it develops primarily within the ducts, invades the ducts secondarily or is of cystic form. Dystrophies of the mammary glands, such as polycystic disease, may also cause a bloody discharge.

The causes in this group of cases comprise the lesions frequently encountered in practice. The bleeding occurs just before the menopause and is due to definite lesions of the breast which may be inflammatory, neoplastic, or dystrophic and either benign or malignant. Its frequency depends upon the location and structure of the lesion. As a rule surgical therapy is indicated. The type of operation depends upon the nature of the lesion.

LEO M. ZIMMERMAN, M.D.

LEE, B. J. Pack, G. T. and Scharnagel, I. Sweat Gland Cancer of the Breast. *Surg. Gynec. & Obst.* 1933 161 975

This article is summarized as follows: The human breast develops as a modified apocrine sweat gland. Apparent sweat-gland tubules and cysts occur in the normal adult breast, where they anastomose with the interlobular lacteal ducts. The characteristic features which distinguish the mammary sweat-gland tubules from the lacteal ducts are constant eosinophilia of the cytoplasm, an inner layer of high columnar cells the occasional presence of myo-epithelial cells surrounding the tubules, and the tendency to form intratubular and intracystic papillary tufts. The anatomical and staining characteristics of these cells persist through all the transitional phases of normal sweat-gland tubules, cysts intracystic papillomata, adenomata, and carcinomata.

Evidence is presented to substantiate the theory that sweat-gland carcinomata of the breast may develop from pre-existing sweat-gland tubules, cysts, and papillary adenomata. The various stages in this transition have been seen. Except for the peculiar properties of sweat-gland structures in the breast which we have enumerated the sweat-gland carcinomata of the breast have much the same structure as other mammary cancers, e.g. we find that the bulky adenocarcinomata the comedocarcinomata, the papillary, intraductal and intracystic carcinomata, the medullary carcinomata, the carcinoma simplex, and even scirrhous carcinomata of the breast are represented in this group.

Sweat gland cancers of the breast occur more frequently in swarthy brunettes whose skin has large pores and an oily coarse texture. Their regional distribution is mostly on the periphery of the breast particularly in the axillary tail and submammary fold. The frequency of pain, skin adherence, and ulceration are significant clinical features of sweat gland cancer of the breast. The degree of malignancy and the prognosis following treatment is practically the same for sweat gland cancers of the breast as it is for the general group of mammary cancers.

ELIZABETH CRANSTON

HERNIMAN JOHNSON, F. Metastases in Breast Cancer: The Problem of Prevention. *Brit. J. Radiol.* 1933 6 468

In every case of palpable tumor in the breast there is a possibility of metastasis, and in most cases of cancer of the breast metastasis is the ultimate cause of death. The only hope of substantially improving present-day results in breast cancer is to discover some means of combating metastatic invasion.

Metastases arise from unremoved or undestroyed portions of the primary lesion or are already present when the local condition is dealt with. If local malignant remainders are the source of metastases, we may hope to check some of them and destroy others by administering roentgen irradiation in suitable doses over a very wide field at intervals over a considerable period of time after an initial attempt to cure by surgery or radium implantation. The beneficial action of such treatment may be due, not to direct injury of the malignant cells, but to the production of a response in the organism which renders it able to deal with the morbid condition. Other agents, notably ultraviolet light, may also be used to advantage because of their constitutional effects.

ANDREW HARRISON, M.D.

TRACHEA, LUNGS, AND PLEURA

Hillman, A.: Streptothrix of the Lungs and Pleura and Its Surgical Treatment (Zur Frage ueber Streptothrix der Lungen und der Pleura und ihre chirurgische Behandlung). *Von chir Arch* 1933, xxvii, 63.

Although the streptothrix is closely related to the actinomycetes, it presents several characteristics from the morphologicobotanical point of view as well as in the clinical picture it produces by which it can be differentiated from the latter. There are numerous forms (over 100) of streptothrix, but only the pathogenic varieties of the organism are considered here.

The pathogenic varieties are encountered less frequently than the saprophytic varieties. When the streptothrix is found in the sputum, feces, or pus the determination of its type is of great importance. Pathogenic varieties of streptothrix grow better at body temperature than at room temperature, and on intravenous or intraperitoneal injection into control animals produce a miliary pseudo-tuberculous spread in the peritoneal cavity. Moreover it must be borne in mind that the streptothrix is frequently associated with other disease processes (tuberculosis, bronchiectasis).

The streptothrix is a true pus-producing organism, and on entering the lungs produces bronchopneumonic foci which show a marked tendency toward necrosis and the formation of cavities (bronchiectases, cavities, abscesses). Frequently an associated suppurative pleurisy is found. The pus or sputum is tough, thick, and chocolate colored and contains detritus-like masses of broken-down granulations and white granules of yeast colonies. In the majority of cases the streptothrix infection simulates pulmonary tuberculosis, but a correct diagnosis can be made by microscopic examination of the sputum or pus.

In the treatment the pus cavities should be opened as widely as possible by rib resection and incision of the abscess. Attention is called to the fact that the lungs often show multiple pus foci. Therefore the rib resection must not be too con-

servative. Operative treatment should be supplemented by internal iodine therapy.

The prognosis is always doubtful, and in advanced cases is poor.

The author reports 2 cases. One was that of a man twenty-five years old who was operated upon for a streptothrix abscess of the right lung and was released from the sanatorium in a serious condition. The other was that of an ape which died from the condition.

G. ALIHOV (Z)

Reale: Comparative Clinical Researches on the Reaction of Sedimentation of the Erythrocytes and on the Leucocytic Formula in Tuberculosis (Recherches cliniques comparatives sur la réaction de sédimentation des globules rouges et sur la formule leucocytaire dans la tuberculose). *Arch. méd.-chir. de P. pour respir.*, 1933, viii, 40.

Following a discussion of the theory and technique of sedimentation of the erythrocytes and the determination of the leucocytic formula, the author reports the results of 603 sedimentation tests and 535 morphological examinations of the blood which were carried out in series in the cases of 184 patients with tuberculosis.

The rate of sedimentation of the erythrocytes and the leucocytic formula controlled in series, although not specific reactions, supplement each other and render more certain the diagnosis and prognosis of the spurts characteristic of the evolution of tuberculosis.

Sedimentation of the erythrocytes is especially the reaction of the acute phase of the evolutionary spurt, and the hemogram discloses the reactions of the final period and the interval phase.

In sanatoria situated at high altitudes the hemogram is of particular value to supplement the findings of sedimentation modified by the hyperglobulia of altitude. This is true especially toward the end of the evolutionary spurt.

The rate of sedimentation shows pathological values especially in the exudate phase of lesions which tend toward the normal in the indurative phase. In the exudative phase the hemogram is changed toward neutrophilia (with almost exclusively degenerative nuclear deviation) and in the indurative phase it is changed toward lymphocytosis. In the cavities there are no characteristic changes. The different types of cavities reflect rather the condition of the pericavitary tissue.

The two tests are of only slight importance in the absolute prognosis of tuberculosis, but are of considerable importance in the treatment of the condition.

ELLA M. SALMOIRAGHI, M.D.

Decker, H. R.: The Results of Phrenic Nerve Operations in 222 Cases; With a Discussion of the Technique of the Operations. *J. Thoracic Surg.* 1933, ii, 358.

The author reports the results of 200 phrenic nerve avulsions and 22 phrenic nerve crushes performed in the period between July 1927 and March,

1933 Phrenic nerve avulsion was done 181 times for pulmonary tuberculosis and 19 times for bronchiectasis.

As treatment for pulmonary tuberculosis, phrenic paralysis was induced in cases of moderately and far advanced disease, both unilateral and bilateral with or without cavitation, and regardless of the location of the lesion in the lung. It was not induced for minimal lesions nor in acute caseous, febrile cases. The primary objective was to secure collapse of the lung and the secondary objective to secure closure of the cavities.

Of the patients treated by phrenic avulsion, slightly fewer than one third (28.7 per cent) are well and working over one third (37 per cent) show improvement 13.3 per cent have not been benefited and 21 per cent are dead. The conclusions as to the present status of the surviving patients are conservative. In no instance was death directly attributable to the operation and in no instance was the phrenic interruption followed by an unfavorable course so closely that the disturbances could be attributed to the operation.

When phrenic avulsion was combined with artificial pneumothorax or thoracoplasty maximal collapse of the lung being obtained, the incidence of recovery was higher. The frequency of favorable results was found to be in direct proportion to the rise of the diaphragm. Therefore it appears that the degree of collapse is of more importance in healing than the cessation of the movement of the diaphragm.

Of 56 cases in which phrenic avulsion was done alone with the special objective of closing a sizable cavity complete obliteration took place in 13 (23.3 per cent) and partial closure in 27 (48.2 per cent). In 16 (28.6 per cent) no effect was observed and in 2 of these the cavity subsequently became larger. The sputum was decreased in 70 per cent of the cases. In 25 per cent it became negative within three months, and in 40 per cent it became negative within a year. Cough was decreased in 67 per cent of the cases, and hemorrhage was stopped in 55.5 per cent.

The author believes that temporary crushing of the phrenic nerve as a trial procedure is indicated in (1) extensive bilateral disease, (2) bilateral disease with predominance on 1 side, and (3) more or less acute spreading unilateral disease with the likelihood of involvement of the other lung. The paralysis of the diaphragm will continue for at least six months if the nerve is crushed for 0.5 cm. of its length, and for a considerably longer period of time if a greater portion of the nerve is crushed.

In the author's opinion a trial of phrenic paralysis is worth while in cases of bronchiectasis before a serious operation such as lobectomy or thoracoplasty is undertaken.

The anatomy of the phrenic nerve is discussed and the technique of phrenic nerve avulsion and crushing is described.

EARL O. LATIMER, M.D.

Moore, R. L. and Cochran H. W.: The Effects of Closed Pneumothorax, Partial Occlusion of One Primary Bronchus, Phrenicectomy and Respiration of Nitrogen by One Lung on Pulmonary Expansion and the Minute Volume of Blood Flowing Through the Lungs. *J. Thoracic Surg.* 1933 II, 468

In a series of anesthetized dogs a separate airway for each lung was provided by the use of a specially devised double-barreled cannula and individual respiratory tracings were made. From the records obtained the tidal air and oxygen absorption of each lung were measured. In addition estimations of the oxygen content of the arterial mixed venous, and aerated blood were made and the volume of blood passing through the lungs per minute was estimated according to the principle of Fick. Measurements of cardiac output and tidal air—total and divided—were made before and after partial occlusion of one respiratory airway before and after division or avulsion of one or both phrenic nerves and before and after the respiration of nitrogen by one lung. The changes in cardiac output and tidal air which accompanied these procedures were compared with those observed after comparable intervals of time in a series of dogs similarly anesthetized and prepared. The findings are summarized as follows:

1. The changes in cardiac output in the preliminary or control experiments were slight, varying from +8.3 to -13.3 per cent after periods ranging from forty five to seventy-two minutes. The changes in the tidal air were also insignificant.

2. Following the production of a unilateral closed pneumothorax, a reduction in cardiac output was observed in every experiment. The decrease ranged from 21.1 to 50.5 per cent. After the introduction of large amounts of air into either pleural cavity the total tidal air likewise was always decreased and in every instance the percentage decrease was greater on the left side. The decrease in cardiac output was not proportional to the size of the pneumothorax or the decrease in tidal air.

3. After partial occlusion of one respiratory airway the tidal air of the occluded lung decreased between 74.9 and 87.1 per cent and that of the unoccluded lung increased between 1.8 and 178.5 per cent. In five of six experiments the total tidal air decreased from 6.2 to 28.9 per cent. In the other experiment there was an increase of 31.1 per cent. The cardiac output decreased in four of the five instances in which the total volume of tidal air decreased. An increase was noted in one experiment in which there was also an increase in the total volume of tidal air.

4. Unilateral phrenicectomy was followed by insignificant increases in the tidal air in two experiments and by an increase of 52.8 per cent in a third. Bilateral phrenicectomy in two experiments resulted in decreases of 8.5 and 10.4 per cent. In four of these experiments the cardiac output decreased from 7.5 to 56.6 per cent. In one experiment the cardiac output increased 24.3 per cent.

5. Following the respiration of nitrogen by one lung, slight changes in tidal air occurred in four instances. In a fifth there was an increase of 32 per cent. The cardiac output decreased in three of five experiments (23.9, 29.5 and 49.2 per cent). In one instance the change was insignificant, being 1.6 per cent. In the fifth, an increase of 114 per cent was probably an error.

6. A reduction in the tidal air of a lung was not necessarily accompanied by a significant change in the proportion of oxygen which it absorbed nor in the percentage oxygen saturation of the arterial blood. This was evident in the control periods of several of the experiments. In one of the pneumothorax experiments, in three of the partial occlusion experiments, in four of the phrenicectomy experiments, and in one of the nitrogen experiments.

From these results the authors conclude that, in dogs, a disturbance of the mechanics of respiration caused by the production of a unilateral closed pneumothorax, by partial or complete occlusion of one primary bronchus, by unilateral or bilateral phrenicectomy, or by the respiration of nitrogen by one lung is followed in most cases by a significant decrease in the minute volume of blood passing through the lungs. The tidal air of one lung may be markedly decreased—as much as 87 per cent—without a shunting of blood to the opposite side.

SAMUEL KARY, M.D.

Costeodant, A. Cancerous Lymphangitis of the Lung, Suffocating Form (*La lymphangite cancéreuse des poumons à forme suffocante*) *Presse méd. Par.* 933 25, 745

Cancerous lymphangitis of the lung of the suffocating form was first described by Raynaud in 1874, but Andral and others had mentioned a similar condition under different names prior to that time. Costeodant has been able to find only seventeen references to the disease in the literature.

Most of the subjects are between thirty five and forty years of age and nearly all of them have had a cancer of the stomach with symptoms dating back some time. In a case reported by the author the patient had been subjected to an operation eight years previously for cancer in the pyloric region. In two of the cases collected from the literature there had been a cancer of the breast. Often the primary focus in the stomach is unrecognized until the pulmonary symptoms become marked.

The prodromal symptoms of invasion of the lung are not characteristic as they consist merely of a rapid loss of weight, weakness, and loss of appetite. They rarely last more than four or five weeks. At the end of that time the characteristic symptoms of pulmonary involvement make their appearance. One of the outstanding symptoms is rapidly increasing dyspnea. The respiratory rate increases and may be over forty per minute. Cough is present without much expectoration. Occasionally there is slight hemoptysis. The heart rate is increased (120 to 160) and the blood pressure low. As a rule the

temperature is not elevated. Physical examination of the lung often reveals a lessened respiratory murmur with scattered coarse rales. Death may occur within a few days after the development of the dyspnea or the patient may live as long as a month. Death usually occurs suddenly in a dyspneic paroxysm.

A ray examination shows that the pulmonary lesions are more grave and more extensive than is evident from the physical examination. Viewed through the fluoroscope, the lungs show a diffuse loss of transparency. In a good plate the lung field is seen to be filled with interlacing lines suggesting the appearance of a fine screen. Where these lines (lymph vessels) cross there are points of added density which may be easily mistaken for milary tubercles.

The essential pathological changes in the lung are distention of the lymphatic vessels and infiltration of the lung tissue by cancerous cells. The lung tissue is abnormally firm, cutting with resistance, but sections will float upon water. The lungs are increased in weight and so voluminous that they entirely cover the heart. On histological examination the lymphatic vessels are found distended by large cancer cells. Involvement of the lymph vessels of the visceral pleura may lead to fibrous deposits or adhesions. The hilus glands are frequently the site of metastases, but the liver, spleen, kidneys, suprarenals, vertebrae and pericardium are rarely involved.

The condition must be differentiated from metastatic carcinomatous masses and tuberculoma. Metastatic carcinomatous masses are distinguished by their size and their relatively slow progression. Tuberculosis may be distinguished by the temperature curve and the bacteriological and roentgenological findings.

The two possible routes for invasion of the lung are the blood stream, and the lymphatic channels. In the author's opinion the invasion occurs by way of the lymphatics. MAXIM W. POORE, M.D.

Loktionov, O.: Operative Treatment of Purulent Pleurisy (*Zu operativen Behandlung eitriger Pleuriden*) *Swed. Frec. Ger.*, 1931 vi, 325.

Of 10 cases of purulent pleurisy in which puncture of the pleural cavity was done, complete recovery resulted in only 5. Open drainage was also tried in a series of cases, but was found to have many disadvantages such as open pneumothorax, constant wetting of the bandages with pus, and the necessity for frequent changing of the dressings. The operative treatment of purulent pleurisy by the closed method by means of valvular drainage gives relatively good results.

The author reviews 120 cases of purulent pleurisy treated during the period from 1903 to 1930. Eighty two of the patients were men and 38 were women. The pleurisy occurred on the left side in 65 cases, on the right side in 32 and on both sides in 5. In 47.7 per cent of the cases the cause was pneumonia, in 30 per cent the condition was an

idiopathic pleurisy, in 75 per cent it was due to tuberculosis and in 67 per cent it was due to injuries. In 105 cases there was an acute empyema and in 15 a chronic empyema.

Twenty three patients were completely cured. Sixty-two were considerably benefited and discharged to the out-patient department with a healing fistula. Seven were not benefited. Three are still under treatment. Twenty-one died. The results in 4 cases are unknown.

The following operations were done: rib resection in 91 cases, thoracoplasty in 11, and thoracotomy in 3. Of the 91 patients subjected to rib resection 20 died, 32 were cured, and 42 were considerably benefited. Of the 20 who died, 4 had tuberculosis. Of 15 cases of chronic empyema, thoracoplasty was done in 11. Six of the 11 patients were cured, 4 were considerably benefited, and 1 died. Resection, which was done in the cases of 44 children was followed by cure in 12, considerable improvement in 24, no improvement in 4, and death in 4. Resection must be done as early as possible. Before the operation the pus should be examined bacteriologically and the chest examined roentgenologically. Treatment by active respiration has proved of no value. The mortality among children after puncture and thoracoplasty without resection is high: 35.6 per cent, and after the closed method of treatment 88 per cent. In chronic cases the Schede operation combined with the decortication of Delorme has proved a life-saving measure.

V. ACKERMAN (Z)

ESOPHAGUS AND MEDIASTINUM

Raven R. W. Diverticula of the Pharynx and Esophagus. *Lancet* 1933 cccxlv 1011

Raven compares the pathological findings with the roentgenological findings in diverticula of the pharynx and esophagus.

Congenital diverticula of the pharynx which arise from the pharyngeal embryonic endodermal structures are lateral in position. They may communicate with the skin as well as with the pharynx. The pharyngeal opening may be below and behind the tonsil or at the bottom of the pyridiform fossa.

Acquired diverticula of the pharynx may be anterior lying in the midline in front of the entrance to the esophagus and posterior to the larynx, but as a rule they are posterior. The pouch is a prolapse of the pharyngeal mucous membrane between the two sets of muscles forming the cricopharyngeus muscle. It may be associated with a marked dilatation of the esophageal orifice, hoarseness due to pressure on the recurrent laryngeal nerve, or ptosis of the eyelid or exophthalmos due to pressure on the cervical sympathetic nerve.

Roentgenological examination is most successful when a thick paste of bismuth oxychloride and water is swallowed and the action is observed with the fluoroscope. It is essential to notice how the pouch empties. The bismuth flows from the upper

part of the pharyngeal pouch, the lower border of the pouch is round and the esophageal lumen is not irregular. In contradistinction, a carcinomatous structure of the upper end of the esophagus shows a dilatation of the esophagus proximal to the stricture. The lower border of this is conical, not round and is followed by marked irregularity of the esophageal lumen. The bismuth is seen to flow from the lower end of the conical dilatation.

In congenital diverticulum of the esophagus associated with an esophagotracheal fistula the esophagus ends blindly forming a uniformly dilated pouch. The lower segment of the esophagus opens into the trachea. On roentgenological examination a large amount of gas is seen in the stomach.

The term tuberculous pouch is preferable to the term traction diverticulum. Tuberculous pouches are most common in the anterior wall of the esophagus below the bifurcation of the trachea. They are small and conical and have an oval orifice. They may be single or multiple.

Diverticula associated with obstruction of the lower end of the esophagus are secondary to cardiospasm. Large esophageal pouches are caused by distal esophageal obstruction which raises the intra-esophageal pressure and thereby causes herniation of the mucosa in an area where the muscle coats have been weakened by local esophagitis.

J. DANIEL WILLIAMS M.D.

Watson W. L. Carcinoma of the Esophagus. *Surg., Gynec. & Obst.*, 1933 liv, 884.

This report is based on 506 cases of carcinoma of the esophagus which were treated in the Memorial Hospital, New York, during the period from 1918 to 1931. Of this number 267 were cases with a positive biopsy diagnosis. In the same period of time there were 29 patients suffering with esophageal obstruction which was attributed to cancer but was later found to be caused by a benign condition such as spasm, syphilis, a non-specific ulcer, an acid or alkali burn or idiopathic stenosis.

Gross examination of esophageal carcinomata demonstrates 3 definite types:

1 The bulky polypoid, vegetative type which grows into the lumen producing symptoms of obstruction at an early stage.

2 The shallow ulcerating type which produces early symptoms of mediastinal involvement such as pain and backache. Metastases and symptoms of obstruction may be absent. This type tends to perforate the musculature of the esophagus early and invade the aorta, bronchi, or trachea.

3 The hard infiltrating, scirrhous type which invades the esophageal wall and may encircle the lumen causing fixation of the wall and producing symptoms of obstruction. The extension of the tumor occurs by way of the submucous lymphatics.

Of the 267 lesions diagnosed by biopsy in the cases reviewed, 243 were squamous-cell lesions, 19 were adenocarcinomata, and 5 were transitional cell tumors. Of the 227 lesions which could be

graded, 12.7 per cent were of Grade 3 and of these 6.1 per cent were reported as probably radiosensitive. Of the 13.9 per cent which were of Grade 2 all were probably radiosensitive.

Autopsy was done in 27 cases. In 13 (48 per cent) of these there was no evidence of metastasis. Gross lymph-node involvement was found in 12 (44 per cent). In 7 (26 per cent) there was extension to or rupture into the trachea or a bronchus. In 3 cases the disease ruptured into the aorta, causing a sudden fatal hemorrhage.

As a causative factor the author suggests the frequent drinking of copious amounts of excessively hot tea, as is done by the Russians. Forty-six per cent of the foreign patients whose cases are reviewed were born in Russia. The Russians outnumbered the native born patients. Syphilis was present in only 7 per cent of the cases.

Cases of cancer of the esophagus constitute 2.5 per cent of all cases of malignancy admitted to the Memorial Hospital New York. Cancer of the esophagus was responsible for 3.38 per cent of the deaths from malignancy occurring in New York City in the year 1931.

Of the 267 cases reviewed by the author 84.3 per cent were those of males. The average age of the males was fifty-seven and four-tenths years, and the average age of the females, fifty-three and eight-tenths years. Sixty-four per cent of the patients stated that their first symptom was difficulty in the swallowing of solid food. This is a rather late manifestation of the disease.

The diagnostic procedure at the Memorial Hospital is as follows:

The complete history is recorded, a physical examination is made, and the patient then referred to the Head and Neck Department where the oral cavity and larynx are carefully examined and blood is withdrawn for a Wassermann test. A fluoroscopic examination with the swallowing of barium is then made and roentgenograms of the esophagus and lungs are taken. The X-ray examinations are followed by an esophagoscopic examination, during which tissue is obtained for biopsy. By the use of a thick barium paste in the fluoroscopic examination it is possible to determine the extent of the lesions quite readily. Of 203 cases in which a roentgen examination was made, the roentgen diagnosis was carcinoma in 97, obstruction in 47, stricture in 21, a filling defect in 29, irregularity in 8, and ulceration in 1. In no case was the lesion missed.

In the irradiation treatment of esophageal carcinoma at the Memorial Hospital crossfiring is done through 4 portals. The beam is directed so that it passes through the minimal amount of lung tissue. It has been found that 2,000 r may be given through each of the portals without blistering the skin or causing severe constitutional symptoms. The lesion is not dilated. Operative extirpation of the lesion has had a high mortality. Palliative procedures such as gastrostomy may be necessary in order to feed the patient. Of the patients whose

cases are reviewed, 71 had had a gastrostomy and external irradiation. Of this group, the average length of life after treatment was six and twenty seven hundredths months. Twelve patients treated with moderate doses of external irradiation survived for an average of five and thirty three hundredths months.

The prognosis is grave. In the cases reviewed, the average length of life after the onset of the symptoms was ten and a half months and the average length of life after admission to the hospital was four and eighty three hundredths months. In 48 per cent of the cases the cause of death was bronchial pneumonia.

ALTON OSMER, M.D.

Zanlger J. H.: Surgery of the Esophagus (*Die Chirurgie der Speiseröhre*). *Verhandl. 9 Kongr. internat. Ges. Chir.* 1932 4, 485.

This is an exhaustive review of the important surgical conditions of the esophagus. In the discussion of carcinoma, attention is called to the claim of Guleux that this condition may be induced by psychic shock leading to spasm with retention and resulting inflammatory irritation. Alcohol is also cited as a cause of irritation. With regard to the treatment, the author cites the results obtained by Guleux with roentgen and radium irradiation, which unquestionably was followed by cure in some instances and marked improvement in others. He cites also a good result obtained by Seifert by endoscopic removal of the lesion in a case of circular carcinoma of the cervical portion of the esophagus. Finally he calls attention to the occasional successful results of surgical treatment, especially in cases of carcinoma of the cervical portion of the esophagus, and the rare good results obtained by surgery in carcinoma of other portions. The different operative procedures and their results are reviewed. Gastrotomy is not of much value even as a palliative measure, and is usually to be considered only as an aid to radium or roentgen treatment. Congenital malformations are discussed only briefly. They are seldom amenable to treatment. This is true especially of tracheo-esophageal fistula. Congenital strictures usually come for treatment late in life and are amenable to dilatation.

For esophageal diverticulum the one-stage operation is generally to be considered, but in some cases diverticulopexy or the two-stage operation is preferable. In the one-stage operation drainage should never be omitted even though it tends to favor the formation of a fistula. A fistula may be caused to close by placing a thin rubber tube against the esophagus.

For the removal of foreign bodies from the esophagus, endoscopy is best. Esophagotomy is justified only in rare instances, particularly for the removal of open safety pins in small children, cases of deep cellulitis, and hemorrhage caused by attempts at endoscopic removal of the foreign body.

In cases of organic benign stricture early dilatation is necessary. This makes it possible to avoid

operative procedures, especially antethoracic oesophagoplasty. In cases of oesophageal spasm it is important to differentiate between functional spasm and spasm produced by carcinoma. Cardiospasm is less a spasm than an insufficiency of the dilators of the cardia and therefore is better called achalasia of the cardia. In early cases the treatment should consist of the repeated passage of bougies, feeding through a tube and dilatation by the Plummer method or with the dilator of Starck. If these methods are insufficient, further procedures are justified. When the Heller operation fails, the operation of Heyrovsky or the Kelling-Lammer operation may be done.

M. STRAUSS (Z)

Gregoire, R.: The Present Status of Surgery of the Oesophagus (Der gegenwärtige Stand der Speiseröhrenchirurgie) *Verhandl. d. 9 Kong. internat. Ges. Chir.*, 1932 1, 219.

Gregoire reviews oesophageal surgery with the exclusion of oesophageal plastics. In his introduction he states that up to the time his article was written oesophageal plastics had been done only in Germany, Russia, and Roumania. Up to 1900, oesophageal surgery was properly in abeyance because the establishment of diagnoses was faulty on account of a lack of investigative procedures. Then, two methods of investigation were introduced simultaneously: roentgen-ray examination and endoscopy. By these methods, the pathology of the oesophagus has been greatly enriched and we have learned to recognise oesophageal ulcer, diverticulum and idiopathic dilatation. Although something was known about these conditions previously, the diagnosis had been usually made only by accident or at autopsy.

In peptic ulcer the fluoroscopic screen often shows notching of the walls elicited by spastic contraction above the ulcer and then the ulcer niche. The oesophagoscope shows the easily bleeding yellow flecked ulcer surrounded by a red inflammatory margin and permits direct treatment of the lesion.

Diverticula of the oesophagus may also be diagnosed accurately by X-ray and endoscopic examinations. In their treatment great progress has been made. This reached its climax in Sauerbruch's operation for diverticula of the thoracic oesophagus. The author has operated upon fourteen pharyngo-oesophageal diverticula in one stage. Eleven of the patients were discharged healed ten days after the operation. In three cases a fistula formed but quickly cleared up.

Progress in diagnosis and therapy have been very great also in cases of mega-oesophagus. This condition should now be studied more thoroughly. It can be readily demonstrated on the fluoroscopic screen. Methods of dilating the diaphragmatic ring bring about improvement, but not a certain cure, and operative procedures such as oesophagogastrostomy by the Heyrovsky method and the cardioplasties are not successful because they affect only the oesophagus and not the oesophageal hiatus. Gregoire there-

fore uses a thoraco-abdominal approach widens the oesophageal hiatus, and performs a cardioplasty.

Foreign bodies in the oesophagus can be removed by the natural routes in 95 per cent of the cases. Operative methods are necessary only when the patient is seen very late. When the foreign body is located in the thoracic portion of the oesophagus the introduction of the whole hand into the stomach after gastrotomy in order to reach the foreign body with a finger through the cardia is dangerous because of the possibility of peritonitis. The author therefore prefers the mediastinal approach. Since the use of the endoscope, foreign bodies are seldom removed operatively.

Also since the use of the endoscope, oesophageal carcinomata are treated less frequently by operation. The various methods and associated difficulties of approach to oesophageal carcinomata and the removal of the tumors are critically reviewed. Practically always the carcinoma has spread beyond its primary site.

The value of the article is increased by a twenty page bibliography.

SALZER (Z)

Turner G. G. Personal Experiences in the Surgery of the Lower Oesophagus (Eigene Erfahrungen in der Chirurgie der unteren Speiseröhre) *Verhandl. d. 9 Kong. internat. Ges. Chir.* 1932 1, 725

In the first half of his work the author discusses cases of benign stenosis of the oesophagus in which he operated either because the stenosis resisted conservative treatment or recurred after transient improvement. Among the operative procedures were plastic operations of the pyloroplasty type and an anastomosis between the oesophagus above the stenosis and the cardiac portion of the stomach. In his first case of oesophagogastrostomy Turner obtained excellent results by a thoracic approach to the oesophagus but he has now given up this difficult and dangerous method, using instead a procedure suggested by Lambert which he describes as follows.

After preliminary gastrostomy which is usually necessary in order to strengthen the patient, a median incision is made from the left angle between the xiphoid process and the costal arch to the umbilicus. The left lobe of the liver is drawn downward and the left suspensory ligament divided with a scissors. The lobe of the liver so mobilized is then displaced backward to the right, the stomach is drawn down, and the peritoneal transitional fold from the diaphragm to the oesophagus is divided transversely with avoidance of the blood vessel in that region. With a finger introduced into the oesophageal hiatus the lower part of the oesophagus is mobilized as far up as possible and drawn downward. For the anastomosis, the posterior external row of sutures between the musculature of the oesophagus and the serosa-covered wall of the stomach is introduced before the mucous membrane of both organs is opened. The diameter of the anastomosis is not less than 1.5 in. The mucosa is

sutured by continuous or interrupted sutures which, preferably, grasp the muscles of the esophagus transversely. Finally, the left lobe of the liver is fixed to the stomach below the anastomosis with a mattress suture. Under certain conditions a rubber drain is placed over the anastomosis.

The author has never noted any complications during the after-treatment.

Turner used this method for the first time in 1923 in the case of a woman twenty-one years of age who since her eighteenth year had the most severe symptoms of cardiospasm. Bougie treatment had been given up because it was too painful. After the operation the patient was completely relieved of her symptoms. The author emphasizes, however, that the operation described should be used only after all conservative methods have been tried. He states that in thirteen of twenty-two cases Walton obtained a complete cure by the digital dilatation of the stomach described by Mikulicz.

French surgeons have claimed that in cardiospasm it is sufficient to free the esophagus from its connective tissue covering and draw it into the abdominal cavity. Of five patients on whom the author operated in this way only one woman, who was operated upon six years ago, has remained free from symptoms.

The author rejects also the proposal to operate upon cardiospasm according to the method of Rammstedt for pylorospasm. Two patients which he treated in this way developed recurrences.

He next reports in detail the case of a man aged thirty-three years who received no benefit from a simple mobilization of the lower end of the esophagus and on whom an anastomosis was done one year later. The patient himself was very well satisfied with the result of the second intervention, even though he reported that he required a longer time to eat than normal. The author was all the more surprised when upon fluoroscopic examination he found that the contrast medium stuck fast for about twenty-five minutes above the stenosis and then emptied itself into the stomach apparently through the original esophageal opening.

The last benign case treated by the author was that of a twelve-year-old boy who at the age of ten years, had been treated for esophageal stenosis by the Rammstedt operation, but had been benefited

thereby only slightly and temporarily. The author did a gastrostomy under local anesthesia, and two months later treated a cicatricial stricture of the lower end of the esophagus which he found at the laparotomy by a cardioplasty of the Heineke-Mikulicz type.

The resection of carcinoma of the lower end of the esophagus is made difficult by the rigidity and the impossibility of lengthening the diseased portion of the esophagus. Two patients on whom the author undertook this operation did not survive. The greatest technical difficulties are presented by malignant tumors of the middle portion of the esophagus as the use of a posterior thoracic route for the operation is almost impossible. Of eight cases of cancer of the esophagus in which the author examined the tumor by the abdominal method, he found the condition inoperable in seven. Once or twice in performing a gastrostomy he took the opportunity to determine the extent of the carcinoma and on the basis of the findings he concluded that he could operate more radically. However, when he attempted to do an extirpation two or three weeks later he discovered that the tumor was fixed considerably firmer and was no longer resectable.

In conclusion Turner describes an operation for carcinoma of the esophagus in a man sixty-two years of age. It was impossible at first to isolate the tumor completely through the abdomen and draw it downward. Therefore the esophagus was attacked by way of the neck and the upper pole of the tumor was exposed through that region. The esophagus was divided and the upper stump fixed to the skin of the neck. However the attempt to draw the lower stump upward was unsuccessful. Finally by introducing the entire hand into the posterior mediastinum, it was possible to free the esophagus from below so that it could be drawn through the abdominal cavity and resected. This procedure caused severe hemorrhage. The opening in the diaphragm was closed by suturing over it the left lobe of the liver. The patient died one week after the operation with the symptoms of sepsis. Autopsy showed that the tumor had been removed entirely and that no dissemination by way of the lymphatic vessels had taken place.

KNOX (2).

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Steinberg, B. and Goldblatt H.: Protection of the Peritoneum Against Infection *Surg Gynec & Obst.*, 1933 LVII 15

The authors report the results of their experiments on peritoneal vaccination by the injection of a suspension of dead organisms in gum tragacanth solution into the peritoneal cavity. They used the bacillus coli suspended in physiological saline solution with a 1 per cent content of gum tragacanth. Previous experiments demonstrated that bacteria suspended in physiological saline solution and injected intraperitoneally pass into the blood and lymph rapidly. When suspended in gum tragacanth solution they remain in the peritoneal cavity longer.

In the typical experiment a dog was given intraperitoneally 50 c.c.m. of a 1 per cent solution of gum tragacanth in physiological saline solution in which were suspended about 200 million heat-killed colon bacilli per cubic centimeter. Following the injection the white cells in the peritoneal exudate were counted at hourly intervals. Up to the fourth hour there was a gradual increase in the number of polymorphonuclear leucocytes. In ten hours, the white cell count in the peritoneal exudate rose to 153,000 per cubic millimeter. After twenty-four hours it was 240,000, and after seventy-two hours, 460,000. The white cells persisted in appreciable numbers in the peritoneal cavity for twenty-six days. For the first forty-eight hours the cells were predominantly of the polymorphonuclear type. In seventy-two hours and from then on, there was an appreciable increase in those of the mononuclear type and a decrease in those of the polymorphonuclear type. The introduction of living organisms into a peritoneal cavity so vaccinated at least twelve hours previously resulted in a marked phagocytosis of the injected bacteria. In a control animal not vaccinated death from peritonitis usually followed when the same dose of live bacteria was injected intraperitoneally.

In 100 clinical cases an intraperitoneal injection of a suspension of colon bacilli in physiological saline solution with a 1 per cent content of gum tragacanth was given from twelve to forty-eight hours before operation. The injection consisted of 30 c.c.m. of this suspension which contained about 200,000,000 organisms per cubic centimeter. The injection was made in the midline, a little below the umbilicus. The urinary bladder was emptied by the patient prior to the injection. The protective substance was administered in cases in which there was danger of peritoneal soiling—cases of resection of intestine (especially of the large bowel), intestinal anastomosis, interval appendectomy, and chronic

pelvic conditions with adhesions requiring the removal of pelvic organs. None of the 100 patients developed acute peritonitis.

The authors conclude that the material acts by evoking a polymorphonuclear hyperleucocytosis with a consequent rapid phagocytosis of living organisms.

MANUEL E. LICHTENSTEIN M.D.

GASTRO-INTESTINAL TRACT

Sturtevant M. Cardiospasm with a Review of the Literature *Arch Int Med* 1933 LI, 714.

Cardiospasm is the name commonly used for a condition in which without a demonstrable obstructive pathological change and usually without pain food does not pass readily from the esophagus into the stomach, but is held in the esophagus. In the majority of cases the esophagus undergoes dilatation and sometimes the dilatation is extreme.

The author suggests that the more frequent occurrence of esophageal disease in males than in females may be due to the greater use of tobacco and alcohol by males. He states that cardiospasm may occur at any age.

The esophageal dilatation may be absent early or may be slight. The esophagus is spindle-shaped or shaped like a club with the bowl of the club down. As a rule the dilatation is found to stop above the cardia at the diaphragm. There is often a chronic inflammation with warty whitish thickening of the mucosa. The mucosa may resemble leather.

The symptoms usually come on gradually with free intervals. The first attack may be severe. The patient is unable to get the offending bolus up or down. He may be unable to swallow even saliva.

In cases in which the condition has a gradual onset the symptoms may be divided into three stages depending directly on the pathological changes. In the first stage the cardia offers resistance to the passage of food intermittently but the esophagus is able at all times to force food through. There is no regurgitation of food at this stage. In the second stage the spasm of the cardia has become so strong that food cannot be forced through readily and regurgitation occurs during eating. Dilatation behind the spastic cardia allows the accumulation of food in the esophagus. This leads to the symptoms of the third stage, which are those of regurgitation at irregular intervals. Second-stage regurgitation occurs during eating whereas third-stage regurgitation may occur also at other times because of the pouching of the esophagus with accumulation of food in the pouch. After esophageal dilatation the food residuum gives a sensation of weight in the chest with anginal pain. The patient is unable to vomit or belch.

The chief complaint is not always dysphagia, and the history may be misleading. Solid foods are held back first and the patient forces them through by swallowing saliva, drinking liquids, breathing, producing pressure on the neck, assuming certain postures, or compressing the thorax.

Among the various physical signs described are dullness to the right of the sternum which, below the sternum, changes to tympany when the oesophagus is full of air, rises when air is pumped in and absence of the second swallowing sound.

Röntgen study is superior to all other methods of diagnosis.

Medical treatment with atropin has proved disappointing.

Many methods have been devised for dilating the oesophagus by means of expanding instruments introduced into the cardia through the mouth. Ordinary bougie treatment may relieve the symptoms partially and temporarily.

Several forms of dilating instruments are employed. Most of them consist of a rubber bag and a silk bag over a tube. The bags having been engaged in the contracted portion of the oesophagus, the rubber is dilated with air or water. The dilatation is measured by the water or air pressure and is limited by the non-expandable silk bag. In some cases it is difficult to enter the cardia even with a small bougie. Under such circumstances the string method must be used. The olive-tipped bougie may be passed on the string and the dilating bag behind the olive tip.

From 5 to 5 dilatations are made. Many patients are relieved by a pressure equal to a column of from 16 to 22 ft. of water. The patient is cured if the oesophagus functions normally ten days after a dilatation. In about 25 per cent of cases a second stretching is necessary. Vinson's mortality is 1 death in 350 cases. Whatever method is used, it is a hospital procedure. HOWARD A. MCKENNEY M.D.

Pollard, W. S.: Histamin Test Meals: An Analysis of 988 Consecutive Tests. *Arch. Int. Med.* 1933, 41, 903.

Pollard characterizes the histamin test meal as "the only available procedure which fulfills the recognized criteria of an adequate functional test, is standardizable, imposes a maximum load on function, and yields pure juice suitable for quantitative analysis. In the 988 tests reviewed the patients were fasted for at least twelve hours and were examined in the basal state. A Wilkins tube was introduced into the stomach and after withdrawal of the fasting contents 0.1 mgm. of histamin per 10 kgm. of body weight was injected hypodermically. Total secretions were then aspirated over successive ten minute periods until secretion ceased. As a large series of cases showed the average difference between free and total acidity to be 10 c.c.m. of N/10 hydrochloric acid per 100 c.c.m. of gastric juice, only the total acidity was tabulated. Standards for normal gastric acidity and volume of

secretion were derived from 684 persons subjected to the test who showed no evidence of disease. In the cases of males the mean total acidity ranged from 101.1 units at the age of twenty-five years to 67.1 units at the age of sixty-five years. In the cases of females the corresponding averages were 80.2 and 66.7 units. In the cases of males the mean maximum ten minute volume of secretion ranged from 39.7 c.c.m. at the age of twenty-five years to 24.0 c.c.m. at the age of sixty-five years. In the cases of females the corresponding averages were 33.1 and 31.7 c.c.m. In both sexes the total gastric secretion declined at about the same rate. The incidence of anacidity increased steadily from youth to old age, but at all age periods was higher in females than in males.

Of 150 persons with duodenal ulcer 91.3 per cent had a total acidity and 79.2 per cent a volume of secretion higher than the mean values of normal persons of the same age. Of 36 persons with gastric ulcer 91.7 per cent had a total acidity and 75 per cent a volume of secretion higher than the mean values of normal persons of the same age. In 56 cases of carcinoma the incidence of anacidity was 69.6 per cent. Total secretion is obtained by multiplying the mean volume by the mean total acidity for each decade. In 87.1 per cent of the males with gastric ulcer and 92.5 per cent of those with duodenal ulcer the total secretion was above the normal mean for their respective ages, whereas in all of the males with carcinoma the total secretion was below this mean.

SARVELL J. FOERSTER M.D.

Salvaggi, G.: Acute Perforations of Gastroduodenal Ulcers (Sulle perforazioni acute delle ulcere gastroduodenali). *Ann. Ital. di chir.* 1933, 22, 41.

In gastric ulcer perforation occurs most frequently near the pylorus, and next most frequently in the order named on the lesser curvature, the posterior wall and the greater curvature. In duodenal ulcer it occurs most frequently in the first part of the duodenum, occasionally in the second part, and rarely in the third. Of the perforations studied by the author, 44 per cent were duodenal, 34 per cent were pyloric or juxta-pyloric, 17 per cent occurred on the lesser curvature, 5 per cent occurred on the anterior surface of the stomach, 1 per cent occurred in the cardia, and 1 per cent occurred on the posterior surface of the stomach.

Perforation is usually single, but may be multiple. The opening may be patent or closed by fibrin or by adhesions to adjacent structures. The gastroduodenal contents may or may not be spilled into the peritoneal cavity. The peritoneal contents will vary with the time that elapses after the perforation, the character of the gastroduodenal contents, and the type of lesion. When the gastroduodenal contents are acid, the peritoneal contamination is usually sterile. With time, it tends to become alkaline, increase in toxicity and become septic.

The first symptom of perforation of a gastric or duodenal ulcer is a sudden excruciating pain,

usually in the epigastrium but occasionally localized or referred to the right upper quadrant of the abdomen. Depending upon diaphragmatic involvement it may radiate to either shoulder. The pain is followed by vomiting, hiccup, shock, thoracic respiration, fever, leucocytosis, a board-like rigidity of the abdomen and a decrease of liver dullness. The differential diagnosis must rule out appendicitis, cholecystitis, and acute pancreatitis.

The treatment indicated is immediate operation. If possible, the operation should be done under local anesthesia supplemented when necessary by ether, but preferably by ethylene. If an incision is made in the right iliac fossa because of an erroneous diagnosis of appendicitis it should be closed and the correct incision made. An erroneous high incision on the right side may be changed to the Mayo-Robson right oblique incision. The diagnosis is confirmed by the escape of gas when the abdomen is opened and the presence of gastric or duodenal contents in the peritoneal cavity. The surgical procedure depends upon the findings. After cauterization of the ulcer the perforation may be closed by two layers of interrupted sutures. In some cases cauterization may be omitted. If necessary a gastro-enterostomy may be done in addition to closure of the perforation. In cases of large callous ulcers which are difficult to close, a tube may be sutured into the perforation to convert it into a gastric or duodenal fistula, and later withdrawn. In the cases of young patients in good physical condition who come to operation early resection may be considered. In addition, a complementary jejunostomy may be indicated. The choice of operative technique must depend upon the judgment of the surgeon. SAMUEL J. FORD, M.D.

McIver M. A. Acute Intestinal Obstruction. *Sixth Installment. Am. J. Surg.*, 1933 xii, 143

In cases of intestinal obstruction early diagnosis is of extreme importance. The history is of great aid. The incidence of intestinal obstruction resulting from adhesions is increasing because more laparotomies are being performed. This is evident from the number of cases seen in the Massachusetts General Hospital. In the ten-year period from 1898 to 1907 there were 37 cases of obstruction occurring early or late after an abdominal operation. In the period from 1908 to 1917, 57 cases and in the period from 1918 to 1927 82 cases.

The pain of intestinal obstruction is colicky. That associated with obstruction of the large bowel lasts longer than that associated with obstruction of the small bowel. When strangulation occurs the pain becomes steady and agonizing rather than colicky because of the infiltration and distention of the loop of intestine. The pain from obstruction of the small bowel is apt to be in the region of the umbilicus or the epigastrium, whereas that due to obstruction of the colon is likely at first to extend across the lower abdomen. Vomiting usually occurs and as a rule is an early symptom. The amount varies with

the level of the obstruction and the stage of the condition. The higher the obstruction the more apt the patient is to vomit. In the early stages of the obstruction the vomitus may consist of gastric and duodenal secretions. If the vomiting continues it may have a fecal odor which is produced by the action of colon bacilli and putrefactive bacteria. Feces appear in the vomitus only when there is a fistulous communication between the stomach and colon. As a rule a definite period of time elapses between the onset of pain and the onset of vomiting.

Obtundation and distention are not constant signs of intestinal obstruction. Distention is most marked when the obstruction is in the left half of the colon. Muscle spasm and tenderness are frequently found early in the condition and particularly when the involved loop lies in contact with the abdominal wall. Tumors may be present, especially in intussusception. Visible peristalsis may occur proximal to the obstruction.

In the diagnosis of intestinal obstruction routine laboratory studies are of little value but plain roentgenograms of the abdomen are of definite aid. In cases of postoperative obstruction it is important to determine whether the patient is suffering from mechanical obstruction or adynamic ileus. The presence of colicky pains associated with visible or audible peristalsis suggests an organic obstruction. The diagnosis of volvulus as a cause of intestinal obstruction is almost impossible. Gall stone ileus usually cannot be diagnosed, but occasionally a roentgenogram will show the filling defect. Mesenteric thrombosis may occur at any age, but is most frequent in later life. It is usually associated with disease of the circulatory system. In addition to abdominal pain vomiting, melena and distention of the abdomen, there is apt to be a leucocytosis. In intestinal obstruction due to a neoplasm the symptoms are less fulminating than in intestinal obstruction due to other causes, and on account of the insidious onset of the condition distention is apt to be a prominent sign. In cases of strangulated external hernia the diagnosis is usually easy but occasionally especially in cases of femoral hernia, the hernia is not obvious. Among 147 cases of obstruction due to a strangulated external hernia which were treated at the Massachusetts General Hospital there were 3 in which the diagnosis was not made until laparotomy was performed and a knuckle of gut was found strangulated in the femoral canal. Intussusception occurs most frequently in infants. Of 9 deaths from intussusception in the Massachusetts General Hospital, only 2 were those of patients admitted to the hospital within forty-eight hours after the onset of symptoms.

ALTON OCHSNER, M.D.

Poncher H. G. and Millar, G.: Cysts and Diverticula of Intestinal Origin. *Am. J. Dis. Child.*, 1933 xiv 1064.

The authors report a case which they believe increases the evidence indicating that the origin of

intramural cysts and diverticula, duplications of the oesophagus, mediastinal enterogenous cysts, and duplications of the colon may be independent of the vitelline duct. The findings in their case were:

1. An intramural diverticulum arising from the ileum contained in its walls gastric mucosa and a polyp composed of gastric mucosa and was terminally constricted to form incompletely separated cysts.

2. A peptic ulcer of the ileum at the upper point of communication with the diverticulum, which was probably the source of the hemorrhage.

3. Extrapleural enterogenous cysts of the mediastinum made up of gastric mucosa, the largest part of which had undergone pressure atrophy and perhaps digestive necrosis.

4. Pressure atrophy of the bodies of the second to seventh ribs, inclusive, secondary to the pressure of the large mediastinal cyst.

5. Atelectasis of the right lung and anemia of the parenchymatous organs.

The authors review the literature and discuss the various theories of the embryonic origin of these malformations. They say "It is difficult to correlate the wide variety of positions of these enterogenous diverticula and cysts, of which our case is an example, with vitelline duct rests." They refer to the work of Lewis and Thury regarding the not uncommon occurrence in embryos of diverticula or accessory epithelial nodules which are derived from intestine occur along the course of the oesophagus, stomach, and small intestine, and ordinarily disappear. Since at the time of obliteration of the vitelline duct the dorsal mesentery and its vessels are already well developed, it is necessary to assume, in the case of intramural cysts and diverticula, that the duct remnants insert themselves not only between well-formed leaves of the mesentery but also between its vessels, deriving an entirely new blood supply from them. In the authors' opinion it is more logical to consider the mentioned epithelial nodes as the source of enterogenous cysts and diverticula lying within the mesentery as well as those found in positions far removed from the site of the vitelline duct.

The diagnosis is difficult. When the cysts occur in the mediastinum the symptoms are those of any benign tumor occurring in that region. Abdominal tumors of this type produce no pathognomonic symptoms, but are often accompanied by obscure abdominal colic and unexplained intestinal hemorrhage.

T. BARRETT JONES, M.D.

Wangensteen, O. H.: Therapeutic Considerations in the Management of Acute Intestinal Obstruction: The Technique of Enterostomy and a Further Account of Decompression by the Employment of Suction Siphonage by Nasal Catheter. *Arch. Surg.* 933, XLVI, 933.

The work of Hartwell and Hoguet establishing the efficacy of the subcutaneous administration of saline solution in definitely prolonging the lives of dogs

with high intestinal obstruction gave considerable impetus to experimental investigation of obstruction of the bowel.

It is now known that an increase in the blood urea, a decrease in the plasma chlorides, and an increase in the carbon dioxide combining power of the blood occur regularly only in high intestinal obstructions and not sufficiently early to be of diagnostic aid. Saline solution acts like a specific only in high obstruction and then not as an antidote or detoxifying agent, but as a substitute for important fluids lost by vomiting.

In cases of late simple obstruction a well-performed enterostomy will usually save life, but an attack directly on the obstruction is extremely hazardous. Enterostomy is life-saving in such cases, not because it drains off a potent toxin that threatens the organism, but because it relieves tension within the bowel, restores the normal blood supply, allows the continuance of absorption from the bowel (which practically ceases in obstruction) and, in the absence of a persistent intrinsic obstruction below, permits automatic establishment of the continuity of the bowel.

The importance of the early recognition of abdominal disorders of an acute nature requiring operation is generally recognized. There is a close relationship between the ultimate mortality and the time intervening between the onset of the condition and the institution of adequate treatment.

After the presence of intestinal colic has been established it is necessary to determine whether the pain is due to mechanical obstruction, acute enterocolitis, abdominal allergy or food poisoning. Of great aid in this determination is a single roentgenogram of the abdomen made with the patient supine. This will reveal the presence of visible gas in the small intestine, a condition which, in the adult, is indicative of intestinal stasis. It will disclose also the degree of distention of the bowel.

Patients with strangulation types of obstruction almost invariably present local tenderness and rigidity of the abdominal wall due to the escape of hemorrhagic fluid into the peritoneal cavity. Their complaints and the other findings of physical examination are those of intestinal colic such as occurs in simple obstruction. There is an early slight quickening of the pulse incident to the loss of blood into the infarcted segment, and early rises of the temperature to 100 or 101 degrees F. are usual. In the early stages of simple obstruction there is no disturbance of the general condition.

A patient complaining of intermittent crampy pain attended by nausea and vomiting but not associated with local tenderness or rigidity of the abdomen may be suspected to have simple intestinal obstruction. If the pain continues despite the expulsion of gas and feces following the administration of enemas and if distention of the small intestine is found on roentgen examination, the diagnosis of intestinal stasis is justified. The occurrence of loud borborygmi significant of increased peristaltic

activity at the height of the pain indicates that the stasis is due to a mechanical cause. The stethoscope is an important aid in the diagnosis.

Successful treatment of acute intestinal obstruction requires early release of the obstruction. Some types of simple obstruction especially those in which decompression of the bowel (enterostomy) serves to re-establish intestinal continuity can be satisfactorily treated by non-operative means (suction siphonage by nasal catheter).

The author has long used nasal catheter aspiration of the stomach and duodenum in functional spastic ileus, and now reports on its use in acute mechanical obstruction. In the latter condition negative pressure suction is employed to aspirate fluids and gas. Sodium chloride is given freely subcutaneously and intravenously to replace the fluids lost by aspiration. It is very important to replace the fluids sufficiently to permit a urinary output of 1,000 c.cm. daily.

Sedatives are rarely necessary. With the use of catheter aspiration, pain almost invariably ceases.

As compared with catheter drainage enterostomy has the advantage that it permits feeding of the patient as soon as the decompression has been accomplished. The nearer the enterostomy is to the point of obstruction the more efficient is the drainage. A midline subumbilical incision is made and a No. 14 catheter inserted by the Witzel technique.

CHARLES F. DuBON, M.D.

Blondor H., and Lamy M.: A Clinical Study of Ulcers of Meckel's Diverticulum (*Étude clinique des ulcères du diverticule de Meckel*) *J. de chir.*, 1933 XL 553

A critical review of about 100 cases of peptic ulcer of Meckel's diverticulum collected from the literature shows that this lesion is being recognized with increasing frequency. It is usually found in children and more frequently in males than in females. Before operation the presence of an ulcer is most often manifested by intestinal hemorrhage. The bleeding may be slight and intermittent or rapidly exsanguinating. Pain is almost invariably present, but may be overlooked in the cases of very young children. The site, duration, and periodicity of the pain are extremely variable. Physical and X-ray examination are of little aid in the diagnosis before perforation occurs. Perforation is frequently preceded by hemorrhage and should be anticipated when bleeding cannot be otherwise explained. Perforation may occur into the free peritoneal cavity, causing an acute and stormy peritonitis, or may be subacute and covered, leading to localized peritonitis or abscess. In the latter event subsequent free perforation is possible.

Peptic ulcer of Meckel's diverticulum should be considered in all cases of melena especially those with attacks of pain. In cases of peritonitis in which appendicitis or intussusception are suspected but not found, perforation of a diverticular ulcer must be ruled out.

LEO M. ZIMMERMAN, M.D.

Laurell, H.: Uncomplicated Intussusception of the Colon Discussed Chiefly from the Roentgenological Viewpoint (*Ueber reine Coloninvaginationen vor allem vom roentgenologischen Gesichtspunkt*) *Acta radiol.*, 1933 XLV 122.

The author reports a case of intermittent intussusception of the colon due to the presence of a tumor. The mechanism of the invagination is shown by serial roentgenograms taken while the ensthealing was in progress.

On the basis of eight cases reported in the literature and his own observations, Laurell discusses the roentgenological diagnosis of this rare form of colonic intussusception in children and adults.

Krecke, A.: The Causes and Nature of Appendicitis (*Ueber die Ursachen und das Wesen der Appendicitis*) *Munchen med. Wochenschr.* 1933 I 299

On the basis of his extensive experience the author attempts to answer the following questions: What conditions determine a fatal outcome of appendicitis? Why has this condition, which previously was rare, become so common and so dangerous? How may we explain the frequent occurrence of complete gangrene of the appendix within a period of three or four hours? Is appendicitis an infectious disease? Does the appendix become involved from the blood stream or the intestine? Is appendicitis contagious? Is it inherited? Can it be caused by certain foods? Can it be produced by foreign bodies? What is its relation to gastric ulcer? Why does it occur particularly in young persons?

Appendicitis has been attributed to infection, neuro-angospasm, mechanical factors, diet, foreign bodies, and trauma. It has also been considered endemic. That it is due to infection there can be no doubt. Operation and autopsy show only a single phase of the disease, but a study of the sequence of phases demonstrates that there is a continuous evolution from simple catarrhal to gangrenous changes. It has been generally believed that the infection of the appendix has its source in the intestine. The theory that it arises by the hematogenous route has been less widely accepted. Hilgermann and Pohl claimed that the causes of the infection are not ordinary intestinal organisms, but streptococci and pneumococci, and that they had found a correspondence between the bacteria of the appendix and those in throat smears taken at the same time. These observations still lack confirmation.

The neuro-angospastic theory of Ricker is compared by Krecke to the new theory of the origin of gastric ulcer and is regarded by him as of great importance. This theory is supported by the attacks of colic which frequently precede severe appendicitis. Ricker attributes the colics to true vascular spasms and therefore assumes that the basic cause of the disease is a severe disturbance of the sympathetic nervous system. This assumption will explain also the familial occurrence of appendicitis.

With regard to the mechanical theory of the origin of appendicitis Krecke states that some factor

In addition to stenosis must be invoked to explain the severe changes in the walls of the appendix. According to Helle this factor may be a fermentative process from the decomposition of protein. Fecaliths are of importance only in the production of stenosis.

In discussing the dietary theory Krecke calls attention to the rarity of appendicitis in certain races which live on an exclusively vegetable diet.

With regard to the theory that appendicitis is caused by foreign bodies, he states that true foreign bodies are very seldom found in the appendix in appendicitis and that there is little evidence to indicate that intestinal worms may cause the condition.

Trauma is responsible for appendicitis in only rare cases. A relationship of the condition to trauma may be assumed only if the trauma was severe and involved the right iliac fossa directly the symptoms of appendicitis developed within two days after the accident, and anatomical examination definitely reveals hemorrhagic infiltration of the appendix. It is possible that an already existing appendicitis may be aggravated by trauma but even this assumption requires caution.

An occasional endemic occurrence of the disease must be admitted.

Krecke comes to the conclusion that the cause of acute appendicitis is still unknown. JAXONER (2)

Loth: Strictures of the Rectum Due to Lymphogranuloma Inguinale (Rectumstrikturen durch Lymphogranuloma inguinale) *Zentralbl. f. Chir.* 1932 p. 99

The author states that it is a mistake to attribute the majority of inflammatory strictures of the rectum to syphilis, tuberculosis, or gonorrhea. A large number of the strictures which occur almost exclusively in women are due to lymphogranuloma inguinale, a venereal infectious disease with a characteristic inflammation and connective tissue reaction which is spread by way of the lymphatic channels.

The bacterium causing the disease is unknown. Its portal of entrance is always the genital tract. Frequently there is extensive lymph-gland enlargement with fistula formation. In women there is often involvement of the deep pelvic and rectal glands with severe secondary inflammation of the wall of the rectum and the surrounding tissues and marked strictures of the rectum or elephantiasis vulvae or anorectalis.

The strictures are usually from 2 to 8 cm. above the anus, but occasionally are higher.

In the differential diagnosis, intracutaneous puncture according to the method of Freisch is confirmatory.

At first, conservative treatment with the use of bougies, rectal irrigations, and diathermy should be given. The author recommends small enemas of pure glycerin which kills the causative organism. In severe cases these measures must be supplemented by the formation of an artificial anus. The artificial anus must not be closed too soon as involvement of

the glands higher up may develop later and cause higher strictures. Occasionally more or less extensive resection of the rectum is necessary.

In the discussion of this report BORCHARDT called attention to the relative frequency of the condition and stated that, as the results of treatment are poor in late cases, it is very important to make a diagnosis before the formation of strictures. DROG (2)

Ralford, T. S.: Epitheliomata of the Lower Rectum and Anus. *Surg. Gynec. & Obst.* 1933, lvi, 21

The author calls attention to the fact that anorectal epitheliomata are a well-known pathological entity although they constitute less than 5 per cent of rectal cancers. Of 353 cases of malignancy of the rectum, only 10 (2.8 per cent) were of a squamous-cell nature. These 10 cases are analyzed from the standpoint of clinical features, pathology, prognosis, and treatment. The ratio of white to colored patients was 4:1. Only 2 of the 10 patients were males. The age distribution corresponded roughly to that of carcinoma elsewhere in the body, the average age being forty-eight and seven-tenths years.

Irritation such as may arise from fissures, fistulae, and chronic ulcers and over-exposure to the X-rays are mentioned as factors which may favor the development of anorectal epitheliomata.

Pain of an aching, boring, or throbbing character is usually present, and there is a heavy sensation in the lower pelvis which bowel evacuation fails to relieve. Itching frequently precedes the pain by weeks or even months. The loss of bright red blood is a common sign. The patient often recognizes an unusual mass or ulcer by palpation. Constitutional symptoms appear late after the disease has become well established.

The appearance of the lesion is usually characteristic, but varies somewhat with the type of the growth and the degree of its malignancy. The small papillary excrescence is perhaps the earliest and most benign form. It resembles a condyloma or venereal wart. In some cases the lesion has the appearance of a small perianal ulcer with an excavated center and a hard indurated base. Biopsy is the only means of differentiating a malignant tumor from a benign tumor.

In the cases reviewed, the tumor was usually either a nodular indurated growth or a perianal ulcer. In the majority of cases the nodular growth was characterized histologically by cells growing throughout the subcutaneous and submucous tissues in a discrete, well-circumscribed manner but showing active mitosis. The perianal ulcer was usually composed of diffusely invading cells of a pure squamous type with few mitoses and many epithelial pearls. The ultimate results indicated that the nodular growth was the more malignant.

Treatment is inadequate. Surgical extirpation, while removing the primary tumor is frequently followed by recurrence or metastases to the inguinal nodes. Irradiation frequently brings about regres-

sion of the primary growth and temporary freedom from symptoms, but death usually occurs later from metastases. The best treatment is believed to be external irradiation followed by radical excision.

In conclusion the author says that in spite of the extremely poor prognosis there is no reason for assuming other than an optimistic attitude if the diagnosis is made early and measures for entire removal of the diseased tissue are instituted promptly.

ARTHUR L. SHREFFLER, M.D.

Heydemann E. R. The Treatment of Carcinoma of the Rectum in the Goettingen Clinic in the Period from 1912 to 1931 (*Die Behandlung des Rectumcarcinoms an der Goettinger Klinik von 1912-1931*). *Beitr. z. Klin. Chir.* 1933, civl, 173.

The four principal operations for carcinoma of the rectum are sacral amputation, sacral resection, abdominosacral amputation, and abdominosacral resection. The choice of operation depends upon the level of the tumor its extent longitudinally and into the surrounding tissues, and the presence or absence of regional lymph-gland metastases. As a large proportion of carcinomata of the rectum develop from polypi the early radical removal of polypi is urged. In a case of isolated, very early, and easily accessible carcinoma of the rectum, local excision may be considered when radical operation is refused by the patient or is rendered impossible by the patient's age or general condition.

In the period from January 1912 to October 1931 346 patients with carcinoma of the rectum were admitted to the Goettingen Clinic. Sixty three per cent were men and 37 per cent were women. Radical operation was performed on 103 (47.2 per cent) of the men 61 (47.6 per cent) of the women and 47.4 per cent of the entire number of patients. Sixty five (18.7 per cent) of the 346 patients died in the hospital. Of the men who were subjected to radical operation, 28 (27.2 per cent) and of the women who were operated upon radically, 12 (19.6 per cent) died in the hospital. Of the patients who were not subjected to radical operation, 25 (13.7 per cent) died in the hospital.

Carcinoma of the ampulla was found in 240 (69 per cent) of the cases. In 78 (25 per cent) the carcinoma was in the region of the anus and sphincter. A high, non-palpable carcinoma was present in 20 (6 per cent) of the cases.

The carcinoma was recorded as being of a polypoid character in 27 cases, but the number of carcinomata arising from polyps was probably higher. In 5 of the 27 cases several carcinomata separated from each other by normal intestinal wall were found. In 3 cases, 2 simultaneously developing carcinomatous foci were discovered.

In many cases the history extended back over a period of years. In 36 cases no rectal examination had been made.

One hundred and sixty four radical operations were performed during the last twenty years. Up to 1920 sacral amputation was the method of choice.

It was performed altogether in 66 cases. In 8 of these the operation could not be carried out radically. In 36 cases the peritoneum was opened from below. In 10 cases prostatic or vaginal resection was necessary. The operative mortality was 15.1 per cent. A cure lasting for five years or longer was obtained in 12 (28.2 per cent) of the cases. Recurrence developed in 29.5 per cent. Great disadvantages of the operation are the necessity of working in the depth of the pelvis without direct vision, and the opening of many blood and lymph vessels which favors metastasis.

Sacral resection was done in 16 cases. Only 1 of the patients who is living has satisfactory sphincter control. The primary operative mortality was 25 per cent. Five (25 per cent) of the patients are believed to be permanently cured.

The abdominosacral operation was done in 15 cases. In 6 cases a coccyectomy was done previously. In 14 cases the abdominosacral operation was performed in 1 stage. The primary operative mortality was 40 per cent. Twenty-six and six tenths per cent of the deaths were due to infection. A permanent cure resulted in 20 per cent of the cases.

Local excision was done in 5 cases. It was followed by cure in 1 case and by recurrence in 4 cases.

Abdominosacral extirpation, which today is the method of choice was done in 62 cases. The technique is exactly like that described by Kirschner and Schmieden, with Bauer's modification of closing the bowel with a rubber cap. Twelve (38.7 per cent) of the men and 8 (25.8 per cent) of the women subjected to this operation succumbed. The primary operative mortality was 32.2 per cent. Recurrence developed in only 3 of the 42 patients who survived the operation. Metastases were found in 7 (16.6 per cent) of the patients. In 31 cases the operation had been performed more than five years previously. Ten (32.2 per cent) of the patients were cured. Patients with an ordinary artificial anus complained least. Some of them did not wear a bag, having full control of bowel movements. In cases in which a sacral anus was formed the results were less favorable. The still high primary mortality will be materially lowered when the operation is performed more frequently in stages. Guleke states that in the first stage the formation of an artificial anus should be done and the operability of the tumor determined. The rectum may be extirpated two or three weeks later. By this procedure shock and the danger of infection are reduced. After the preliminary decompression of the bowel the patient comes to the second and more serious operation in better condition. In cases of operable tumors primary irradiation with the X rays or radium is inadvisable. In some of the cases reviewed prophylactic postoperative irradiation was given. Combined roentgen and radium therapy is indicated chiefly in cases of inoperable carcinoma. By this treatment the spread of the carcinoma may be

considerably retarded. In many of the cases reviewed X-ray and radium irradiation was combined with repeated electrocoagulation following the formation of an artificial anus. Unbearable pain in inoperable carcinoma of the rectum can be relieved by chordotomy.

ERICH HEMMERL (Z)

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Chapman, C. B., Snell, A. M., and Rowntree, L. G.: Compensated Cirrhosis of the Liver: A Plan for More Intensive Consideration of the Earlier Stages of Disease of the Hepatic Parenchyma. *J Am Med Ass.*, 1933, 9, 1735.

The authors stress the importance of an early diagnosis of cirrhosis of the liver since to be successful treatment must be begun early.

In fifty-eight cases of chronic degenerative changes of the parenchyma of the liver which are reviewed, the outstanding etiological factors were alcohol (twenty-five cases), cholecystitis (fourteen cases) and syphilis (ten cases). The authors emphasize the importance of infection, but believe that although single factors may cause cirrhosis, a multiplicity of chemical and infectious agents acting simultaneously or in sequence are probably the usual causes of degeneration and fibrosis of the liver. They call attention to the fact that five of the patients whose cases they review had previously suffered from hyperthyroidism.

On the basis of a complete history which included all complaints up to the time of the patient's admission to the hospital, the fifty-eight cases reviewed were grouped according to their major symptoms as follows: gastro-intestinal symptoms with jaundice, twenty-four cases; gastro-intestinal symptoms with hemorrhage, eleven cases; gastro-intestinal symptoms with both hemorrhage and jaundice, three cases; hemorrhage only, two cases; jaundice only, four cases; and various gastro-intestinal symptoms only, fourteen cases. Loss of weight and asthenia were common. The average loss of weight was 33½ lb. Examination revealed a palpable liver in forty-eight cases, slight edema of the lower extremities in twenty, visible jaundice in seventeen, hemorrhoids in nine, visible collateral circulation in seven, and hernia in six. The authors believe that hepatic enlargement is the principal and significant physical finding, and that a clinical diagnosis is doubtful in its absence. A moderate anemia occurs in about one-third of the cases. More severe anemia is due to hemorrhage. The authors place considerable reliance in the diagnosis on the results of bromsulphalein tests of hepatic function. Retention of Grade 1 was noted in five of the cases reviewed, of Grade 2 in five, of Grade 3 in twelve, and of Grade 4 in six. In twelve cases the results of the test were negative as the dye was not retained in significant amounts.

No attempt is made to classify the cases pathologically but the authors believe that alcohol is a causative factor in 40 per cent. In cases due to

alcoholism, total abstinence from alcohol is important in the treatment. A follow-up study of the alcoholic cases reviewed disclosed that the mortality was higher and the duration of life after examination at the clinic was shorter in this group than in the total group. Approximately 50 per cent of the patients died with an average of two years after the examination. However, restoration to health is possible. Two cases in which it occurred are cited.

The authors call attention particularly to the cases associated with intermittent or chronic obstructive jaundice. In this group treatment appears to have little effect and the prognosis is unfavorable. In six of the cases reviewed, death occurred within about three years after the examination.

The group of cases in which syphilis seemed to be a cause included only cases which were positive serologically and showed clinical manifestations of syphilis and signs of diffuse injury to the parenchyma of the liver. In a small number a history of alcoholism was given. The prognosis in this group was surprisingly good, better than that in cases with a history of alcoholism or chronic hepatitis and jaundice. Only one of the ten patients is dead. The others are in relatively good health.

The six patients in the series presenting Banti's syndrome of splenic anemia were subjected to splenectomy. In each case evidence of cirrhosis of the liver was found at operation. Five of the patients are still living and in fairly good health. One patient died three years after the splenectomy from an unknown cause. Splenectomy seems to offer the greatest aid in cases of splenic anemia.

Twenty-eight of the fifty-eight cases reviewed were treated by operation. Splenectomy was done in twelve. The results show that in latent or compensated cirrhosis surgical exploration and even major surgical procedures are not associated with great immediate risk.

Twenty-five of the fifty-eight patients are dead. Three died following a profuse gastro-intestinal hemorrhage, two of coma probably of hepatic origin, one of an intercurrent infection, and four of a cause not related to the biliary tract. In the cases of sixteen patients accurate information relative to the terminal illness could not be obtained. Of the thirty-three patients who are still living, twenty are fairly well, six have had attacks of jaundice and three have had hemorrhages. The remaining thirteen complain of gastro-intestinal symptoms of various degrees of severity. The average duration of symptoms in the cases of the thirty-three patients who are still living was slightly less than eight years.

A careful study failed to reveal any sign or symptom on which the prognosis could be based in an individual case. It appears that the patients with the largest livers had a more unfavorable course than those whose livers were described as small. Patients with anemia apparently had a less favorable outcome than those with normal blood. Tests

of hepatic function with bromsulphalein have definite prognostic significance. The alcoholic patient with an enlarged liver and a positive bromsulphalein test has only about an even chance of surviving for three years or more, regardless of the fact that he has not reached the stage at which an unqualified clinical diagnosis of cirrhosis can be made. The patient with chronic or intermittent jaundice and an enlarged liver has an equally unfavorable prognosis. If syphilis is included as an etiological factor the gravity of the condition may be somewhat lessened. Patients with Banti's disease and secondary cirrhosis who have not yet reached the stage of portal status and ascites have a good outlook as they respond well to splenectomy. In cases of compensated cirrhosis a history of hemorrhage or the finding of collateral venous circulation may constitute a definite surgical indication. In the presence of jaundice the possibility of a stone in the common duct must be considered. If the patient gives a history of alcoholism and hematemesis, a Talmá Morrison omentopexy and ligation of collateral venous channels should be considered. Excellent clinical results have been obtained from this procedure. Most failures have occurred in cases in which the disease had reached an advanced stage at the time of the operation. Splenectomy if performed early, may offer far more if there is a history of hematemesis and anemia with moderate or slight retention of dye.

JOHN A. WOLVER, M.D.

Brackertz: Animal Experiments with Regard to Inflammation of the Extrahepatic Bile Ducts (Nierexperimentelle Entzündungsversuche an den extrahepatischen Gallenwegen) *Zentralbl. f. Chir.*, 1933 p. 107

The varieties of bile-duct infection have been investigated from all aspects, particularly the path ways by which the infection reaches the ducts. However the inflammatory changes in the wall of the common duct have received relatively little attention. The author has therefore made comparative studies of the course of bacterial inflammation in the gall bladder and the common duct of rabbits. The experiments were divided into those of acute inflammation of two or three days duration and those of chronic inflammation lasting five weeks. Dilute bouillon cultures of colon bacillus or streptococcus hemolyticus were injected through the papilla into the common duct. In one series of experiments the wall of the common duct was injured by repeated punctures with a needle while in the others injury was carefully avoided. In some cases the common duct was tied off, while in others it was left open.

In the experiments with regard to acute inflammation in which the common duct was left open and uninjured inflammation of the mucosa of the common duct was found occasionally but the wall of the gall bladder was often acutely inflamed in all of its layers. When the duct was injured there was almost always an inflammation involving all of the

layers of the duct as well as an acute cholecystitis, whether or not the duct had been tied off.

In the experiments with regard to chronic inflammation in which the common duct was left open and uninjured examination revealed marked thickening and chronic inflammation of the entire gall bladder wall marked cellular infiltration of the papilla, and in some cases marked ulceration extending into the muscular layer. The wall of the common duct showed inflammatory changes confined to the mucosa with some ulceration. When the duct was injured and tied off a granulating inflammation with marked thickening of the wall was found. The gall bladder was also chronically inflamed. When the duct was left open it was unchanged in two cases in spite of extensive injury. In one case it was slightly thickened and showed perivascular cellular infiltration in its wall. When the duct had been ligated the gall bladder was cicatricially contracted.

The experiments therefore demonstrated that the gall bladder wall is always more intensely involved by the inflammation than the wall of the common duct. This fact is attributed to anatomical differences. The wall of the common duct has a taut elastic layer beneath the mucosa which protects the duct from injury, whereas the gall bladder wall lacks such an elastic layer.

SCHROEDERMAN (2)

Ibáñez, A. I. L. Choledocholithiasis (La litiasis de la vía biliar principal) Res. médico-quir. de pátol. fém. since 1933 (667)

Ibáñez reviews the present status of our knowledge regarding choledocholithiasis and reports twenty-four cases from Althabe's clinic in Buenos Aires. The chief topics discussed are the bacteriology and pathogenesis of gall stones and the surgical pathology symptoms, diagnostic tests and methods of examination differential diagnosis, operative technique, pre-operative and postoperative care, immediate and late postoperative complications, prognosis and causes of postoperative death in cases of stones in the common duct.

Of the twenty four patients whose cases are reported three refused operation. Of the five who died, all were seriously infected and in poor general condition at the time of their admission to the clinic. One died of shock, one of hepatic insufficiency two of angiocholitis, and one of angiocholitis and suppurative choledochitis. The patients who were in satisfactory condition at the time of operation made a prompt and uneventful recovery. In all of the cases a supraduodenal choledochotomy with drainage through a T tube was done. In 58 per cent, a complete cholecystectomy, and in 21 per cent, a partial cholecystectomy was done in addition.

In the diagnosis Ibáñez has had little success with cholecystography and relies more on the various chemical examinations. He recommends systematic pre-operative duodenal intubation for both diagnosis and treatment.

Thäses concludes that the gravity of the local complications of stones in the common duct demonstrates the necessity for early operation. Calculous angiocholitis is the source of the majority of both local and general complications. Its seriousness depends upon the kind of bacteria causing it. Streptococic angiocholitis is exceptionally grave.

Every case of gall stones is a potential case of hepatic insufficiency. Involvement of the liver is a most important factor in the later prognosis and the postoperative treatment. In many cases some degree of hepatic insufficiency is present and may account for serious symptoms following operation. From our knowledge of lithiasis involving the entire biliary tract and of intrahepatic lithiasis it is evident that, in spite of the most thorough exploration of the biliary passages, the surgeon may be unable to remove all of the stones.

There is general agreement as to the choice of operation and the operative technique. Supraduodenal choledochotomy with drainage is the rule, and a complementary cholecystectomy is almost always necessary. Duodenotomy is advisable only exceptionally, but is sometimes necessary for exploration of the ampulla of Vater. Retropancreatic duodenotomy has no established indications. The results of supraduodenal choledochotomy are satisfactory: true recurrences, fistulae, and herniae are unusual. In simple cases with only slight infection there is no mortality. Acute angiocholitis and hepatic insufficiency are responsible for the majority of deaths.

The article is supplemented by a bibliography of 173 references, chiefly to Argentinian and French literature.

MARY ELIZABETH MORSE, M.D.

Mallet-Guy P. Auger L. and Gruzat, P.: An Experimental Study of Division of the Sphincter of Oddi (*Étude expérimentale de la section du sphincter d'Oddi*) *Rev de chir. Par.*, 1933 III, 439

The authors studied the effects of transduodenal section of the sphincter of Oddi in dogs. The animals were kept under observation over a period ranging from three to eleven months. In all, loss of weight, a continuous low fever, and occasional digestive disturbances were noted. At necropsy, dense adhesions due to inflammation of the biliary tract were found about the under-surface of the liver. The common duct was thickened, distended, and discolored. The dilatation of the duct was apparently the cause, rather than the result, of the ascending infection. The gall bladder was thickened and inflamed and contained turbid fluid or gravel. The inflammation of the gall bladder was associated with hyperplasia of the mucous glands of the organ. In 50 per cent of the animals concretions were found. The bile yielded positive cultures of intestinal organisms. The liver was firm and congested, and its lobulations were intensified. The ducts were distended. No gross lesions of the liver were found, and cultures of the liver were negative. One of the dogs died of acute suppurative cholangitis with milary abscesses of the left lobe of the liver.

The authors conclude that, in the dog, division of the sphincter of Oddi gives rise to two types of disturbances. The first is a functional derangement of the mechanism of biliary excretion leading to loss of contraction, stasis, and stone formation in the gall bladder and the second an ascending infection from the reflux of duodenal contents into the common duct.

LEO M. ZIMMERMAN, M.D.

GYNECOLOGY

UTERUS

Nilsson F. Experiences With Adenocarcinoma of the Uterine Cervix (Erfahrungen ueber Adenocarcinoma coll uteri) *Acta radiol.* 1933 xiv 283

The author reviews twenty-six cases of adenocarcinoma of the cervix which were given primary irradiation treatment at Radiumhemmet Stockholm during the period from 1926 to 1935. Fifty three per cent were operable. Clinical healing resulted in 64 per cent of the operable cases and 41 per cent of the inoperable cases. A five-year cure was obtained in 19.23 per cent of the entire series, 38 per cent of the operable cases, and 8 per cent of the inoperable cases. Local recurrences developed in 50 per cent, and glandular recurrences and recurrences in the connective tissue of the pelvis in 50 per cent.

Adenocarcinoma of the uterine cervix have a marked tendency to become general. The typical and most frequent form of glandular cancer of the cervix does not cause symptoms early. This fact and the tendency of the lesion to become disseminated account for the relatively low incidence of permanent cures. There is nothing to indicate a low degree of radiosensitivity or the necessity for larger doses of irradiation. Nor is there any reason to believe that, in cases of this character, surgical treatment would produce a better result than irradiation therapy alone.

Curtis, A. H.: Coincident Surgical Exposure and Radium Therapy in the Treatment of Extensive Cervical Cancer. *Surg., Gynec. & Obst.*, 1933 lvi, 1032

In the early days of radium treatment attempts to obtain cures with massive doses resulted in a high incidence of destructive lesions of the adjacent viscera often terminating in fistula formation or death. It was learned relatively early that the pelvic viscera are highly susceptible to injury from radium and that many cervical cancers cannot be cured by radium treatment because proximity of the bladder prevents their efficient irradiation. For several years, therefore, Curtis has made a practice of separating the bladder and displacing it upward to permit more extensive use of radium in the treatment of the uterine cervix without the danger of causing a vesical fistula.

The value of dissection and retraction not only of the bladder but also of the other vulnerable tissues has become more and more apparent and has eventuated in a combined method of surgical exposure and coincident radium application. The suggestions advanced in this article apply particularly to the treatment of cases of cervical cancer

in the second stage and the less advanced cases of the third stage.

The necrotic cervical growth is treated by surgical diathermy or prophylactic irradiation at least three weeks prior to operation. Preliminary deep X-ray therapy may serve equally well in healing the sloughing cancerous surface.

Under anesthesia, a preliminary pelvic examination is made to determine the extent of the growth and the amount of intervention required. Exposure of the cancer bearing uterus and adjacent cellular tissues is then undertaken. The bladder is mobilized upward by blunt dissection, the cervix encircled by an incision such as is made for a radical vaginal hysterectomy and the vaginal mucosa is painstakingly dissected laterally and posteriorly along the natural lines of cleavage. The body of the uterus and the regions of the broad ligaments and cardinal ligaments are then well visualized. With the organ half delivered vaginally the bladder safely anchored in its elevated position with a catgut suture holding it high on the uterus, and the paracervical tissues exposed, a massive radium treatment is possible. Radium needles or radon seeds are introduced where needed, close to or into the cervix or far from it, with the assurance of the safety of adjacent vulnerable organs. After the burying of the radium needles or radon, a chain tandem of radium capsules is inserted into the uterine canal in the usual manner. The procedure is completed with a vaginal pack. Irradiation up to 3500 mc. may be given.

ALBERT M. VOLLMER, M.D.

Kammler H.: Postoperative Recurrences of Cervical Cancer. Their Location Symptomatology Diagnosis, Differential Diagnosis, Prophylaxis, and Treatment (Das postoperative Rezidiv des Carcinoma colli uteri. Seine Lokalisation, Symptomatologie, Diagnose, Differentialdiagnose, Prophylaxe, und Therapie) *Arch. f. Gynaek.* 1933, cl, 339

This is a detailed discussion of the clinical characteristics of postoperative recurrences of cancer of the cervix. The author distinguishes 4 types of recurrence: (1) the local recurrence (in the scar) which arises because of persistence of the cancer in the field of operation; (2) the glandular recurrence; (3) the metastatic recurrence; and (4) the implantation recurrence. Of 374 cases of postoperative recurrence seen by Kammler local recurrences were found in 242 glandular recurrences in 88, metastatic recurrences in 13 and implantation recurrences in 4. In 37 cases it was impossible to classify the type of recurrence.

After the Wertheim operation, 60 per cent of the recurrences were local and 26 were glandular. After

the radical vaginal operation with bilateral removal of the adnexa, 55 per cent of the recurrences were local and 30 per cent were glandular. These figures show that non-removal of the regional lymph glands in the vaginal operation did not materially increase the incidence of postoperative glandular recurrences. However there was a surprising increase in the frequency of local recurrences after radical vaginal operation in which the adnexa were not removed, the incidence of such recurrences being increased to 67 per cent whereas after removal of the adnexa it was only 55 per cent. Hence it seems logical to advocate removal of the adnexa as a part of the technique of radical vaginal operation for cancer of the cervix.

Recurrences appear most frequently during the first year after operation. They are less frequent in the second and third years, but there is no definite time limit for the development of late recurrences.

The histological type of the cancer is of secondary importance in the appearance of late recurrences. However, it appears that in cases of solid cancers composed of less mature cells invasion of the lymphatics occurs very early since most glandular recurrences develop in this group. Nearly always, the histological picture of the recurrent tumor conforms to that of the primary tumor but, as is well known, variations may occur in the sense that the primary tumor may be a solid cancer of middle maturity for example, whereas the recurrence may be composed of very immature cellular elements.

The author next discusses the symptoms of recurrences. He emphasizes especially the importance of the condition of the appetite. Women with a good appetite seldom harbor a recurrence. Marked anorexia is sometimes the first subjective sign suggesting the presence of a recurrence. Early diagnosis of recurrence is essential.

The possible findings of palpation are described. Sometimes biopsy is of aid in the diagnosis. According to Philipp the roentgenogram is often of assistance. A single determination of the sedimentation time of the erythrocytes is of little value, but the findings of repeated determinations combined with those of other clinical methods may be of aid.

The author presents a detailed description of the urological findings in recurrence. The postoperative cystitis following extensive operations for carcinoma is somewhat physiological and usually disappears in two or three weeks. Nearly always there is also an edema of the bladder which persists for from one to three weeks. Very frequently there is a considerable amount of residual urine, as much as 40, 60, or even 900 ccm. Cystoscopic examination discloses deep bladder pouches and, later, diverticula-like formations due to cicatricial retractions. It is surprising how often ureteral reflux is demonstrated after operation. Radium and X-ray irradiation bring about further changes in the bladder such as petechiae and ecchymoses, but these do not indicate recurrence of the cancer. In recurrences there is a bulging of the bladder wall which is followed first

by edema of the wall, later by bulious edema, still later by the appearance of cancerous villi, and finally by penetration of the tumor. Bladder pain is nearly always absent. Slight cloudiness of the urine is often the only sign.

Proctoscopic examination may also aid in the diagnosis of recurrence. First, there is a dimpling of the rectum by the recurrence then, an umbilicated retraction of the mucosa later a definite edema and finally ulceration.

The operative removal of the recurrence is extremely difficult and often useless. However the author reports a case of eight year cure of a rather extensive local recurrence. Among the indispensable palliative procedures is colostomy. The author does not approve of resection of the presacral nerve for the relief of pain. He states that in most cases the treatment should consist of irradiation. It is important to administer by the vaginal route large doses of radium irradiation with good filtration and at a sufficient distance. Sometimes rectal applications are employed. The use of radium needles and radium points is also to be considered.

A cure may be considered permanent when it persists for five years after operation. Of the 374 recurrences reviewed, 36 (about 10 per cent) were cured. This incidence of cure compares favorably with that reported in the literature. If recurrences not proved by histological examination are excluded, the incidence of permanent cure was 8.1 per cent.

E. PHILIPP (G)

Kammfuer H.: Postoperative Recurrence of Cancer of the Cervix. The Clinical Manifestations of the Different Forms (Das postoperative Rezidiv des Carcinoma coll. uteri. Krank der ektischen Einschleppformen) *Arch. f. Gynæk.* 1931 cl, 156.

In this contribution, which is intended to supplement an earlier, general article, the author describes in detail four types of postoperative recurrence of cancer of the cervix with regard to their clinical and roentgenological characteristics. The four types are (1) the local, (2) the lymph-gland, (3) the implantation, and (4) the metastatic. The article is based on cases of cervical cancer treated at the Peham Clinic and carefully studied and followed over a period of years. The chief subjects considered are the early diagnosis, differential diagnosis, prognosis, and treatment.

The local recurrences may appear in the vagina, in the midline behind the vaginal stump, in the parametrium, or in the uterosacral ligaments. It is most apt to occur in the vagina when, instead of the radical operation, simple hysterectomy with removal of little or none of the vagina has been done. Vaginal cancers are not rare and have been observed as long as fourteen years after operation. In this type of recurrence kidney function remains unaffected for a long time. Confusion of the recurrence with benign granulation tissue arises only in the first two years after the operation. Later the condition must be differentiated chiefly from radium

ulcer. A correct diagnosis is important as in cases of radium ulcer the combined radium and roentgen irradiation which is advisable in cases of cancer recurrence only increases the necrosis and leads to fistula formation. A permanent cure may be expected in about 10 per cent of cases treated by irradiation. Fifty-seven per cent of the patients die in the first year.

The median local recurrence may invade the vagina secondarily and may early involve the bladder and rectum because of its close proximity to them. This type of recurrence is frequent especially after the less extensive operations. As a rule it appears within a year, but in 15 per cent of the cases reviewed by the author it was first noticed fifteen years after the operation. The most important symptom is difficulty in defecation. Obstipation persisting for from six to eight days in spite of the administration of strong cathartics is not uncommon. In the differential diagnosis inflammatory processes must be considered, but as a rule can be easily ruled out because of their more severe pain. The results of combined X-ray and radium therapy are poor probably because of the rapid growth of the recurrence beyond the limits of a local lesion. A permanent cure is obtained in only from 5 to 8 per cent of cases at the most.

The parametrial recurrence develops from cancerous nodules which have remained on the ureters the stumps of the uterine arteries, the bladder, the rectum, or the stumps of the uterine ligaments. It is not frequently observed after conservative operations. It is the most common type of recurrence and usually develops very early after the operation. The results of treatment are very good because, especially in the beginning the cancer nodules are situated so close to the vagina and rectum that they are readily accessible to irradiation. Of the cases reviewed early and complete irradiation therapy resulted in permanent cure in about 50 per cent. However the author admits that there is reason to doubt the cure as the diagnosis of "beginning recurrence" was not proved by histological examination. Operation for these recurrences was rejected because of the difficulties which would be encountered after the previous radical operation.

Recurrence in the uterosacral ligaments is a variety of parametrial recurrence, but has a very unfavorable prognosis. Of the cases reviewed a permanent cure was obtained in only one.

Lymph-gland recurrences are divided into those occurring (1) on the pelvic wall, (2) in more distant glands, and (3) in the inguinal glands. The pelvic wall recurrences arise in the lower hypogastric glands and cause characteristic symptoms by compressing nerves which supply the lower extremities and the ureter on the same side. Treatment of such recurrences is practically useless as the application of radium is almost impossible on account of the location of the lesion. If the glands are still mobile their removal may be attempted by laparotomy possibly combined with abdominal radium

surgery. Of the cases reviewed a permanent cure was obtained by irradiation in only 7 per cent. Eighty per cent of the patients died within a year after the appearance of the recurrence.

Recurrence in more remote glands is much less common than recurrence on the pelvic wall. It involves first the higher lymph glands in the region of the uterus. The author has found recurrences of this type only after radical operation particularly abdominal interventions. Twenty-seven per cent developed five years after the operation and some were not observed until after nineteen years. The treatment is early operation or X-ray therapy. However, X-ray therapy has not yet cured a single case. In the cases reviewed, most of the patients died within seven months, and most of the deaths were caused by uremia due to compression of the ureter.

The development of a recurrence in the inguinal glands as the only recurrence after operation is attributed by the author to the postoperative change in the lymph flow. As a rule recurrences of this type develop early. In the treatment, the combined use of the X-rays and radium comes up for consideration but in early cases operation is to be preferred. The prognosis is poor because metastases have usually already occurred in a vital organ. Of the cases reviewed, a permanent cure was obtained in only one.

The implantation recurrence develops, according to the operation performed, in a Schuchardt incision or a laparotomy scar. When it occurs in the Schuchardt incision the author recommends operation only when it is very isolated and movable. In all other cases he recommends combined irradiation. However the results of both methods are poor. In none of the cases reviewed was a permanent cure obtained. In uncomplicated cases of implantation recurrence in the abdominal wall the prognosis is relatively good.

Metastatic recurrence developing as the first recurrence after a radical operation is rare. It usually appears within three years after the operation. Its location varies. Treatment is practically useless.

In conclusion the author discusses a number of cases in which several recurrences developed simultaneously.

P. LAFITZA (G)

ADNEXAL AND PERIUTERINE CONDITIONS

Regad, J.: A Study of the Pathological Anatomy of Torsion of the Fallopian Tubes (Etude anatomopathologique de la torsion des trompes utérines). *Gynéc. et Obst.* 1933 xxvii, 519.

Although the literature contains many reports of cases of torsion of the fallopian tubes pathological studies of the condition have been few. The author describes the macroscopic and microscopic changes which result from torsion of normal and diseased tubes, the effects of the torsion on adjoining organs, and the end results, such as spontaneous amputation or unilateral disappearance of the adnexa.

In torsion of the diseased tube the gross findings are usually quite characteristic. The twisted tube may occupy various sites in the pelvic or abdominal cavity but is situated most commonly to one side of the uterus and descends more or less completely into the cul-de-sac. Torsion appears to occur more frequently on the right side than on the left. Of 201 cases seen by the author the right tube was involved alone in 60 per cent and the torsion was bilateral in 5 cases. The twisted tube usually has a characteristic violaceous, blue-black color. When gangrene has developed, the surface presents areas of a greenish hue. The tube varies considerably in size and consistency depending upon the nature of the disease process which preceded the torsion and upon the time which has elapsed since the twist occurred. Its size may vary from that of a large nut to that of an adult's head. The most frequent causes of torsion of the fallopian tubes are tumors, cysts, and tubal gestations occupying the distal ends of the tubes.

The twist occurs most commonly in the region of the isthmus. The tube may be involved alone or the ovary with its vessels, nerves, and ligaments may be included in the pedicle.

The degree of twisting ranges from complete constriction with infarction and subsequent amputation to simple torsion without circulatory disturbances. Most commonly from $\frac{1}{4}$ to 5 or 6 turns are found, but as many as 25 complete twists have been reported. Pathological changes (thrombosis, edema, multiple hemorrhages) result in an increase in the size of the ovary which often leads to degeneration and detachment. Adhesions to the pelvic viscera and intestines are not uncommon. Fluid is usually present in the peritoneal cavity. The fluid may be sanguineous as the result of tubal apoplexy or a clear exudate or transudate. The other adnexa may be normal or similarly affected. Histologically, the changes produced in the tubes consist chiefly of hemorrhage, edema, infarction, capillary or venous stasis, and degeneration resulting from circulatory impairment.

Of the 201 cases of torsion observed by the author, the tubes were considered normal in 23 per cent and the torsion occurred on the right side in 68 per cent. The gross appearance of the twisted normal tube does not differ markedly from that of the twisted diseased tube. The distal extremity of the tube is usually patent. In general twisted normal tubes are less resistant to the touch and are difficult to recognize by palpation. Their size varies considerably but generally ranges from that of an egg to that of a medium-sized orange. The twist usually occurs just above the ampulla. In the majority of the cases reviewed the tube showed only 1 twist, but in 30 per cent from 4 to 6 twists were found. Involvement of adjoining organs may occur although its extent is usually less than in cases of diseased tubes. The cause of the twist can often be determined from the state of the other tube, which is usually long and mobile and contains convolutions

of a fetal type which often extend to the point of attachment to the uterus.

The problem of determining whether the tubes were healthy before the twist occurred is often difficult to solve. Since secondary infection usually follows promptly after the accident, the presence or absence of an inflammatory reaction is not a safe criterion. Nor is it always possible to determine the presence or absence of other pathological states which may have been causative, such as embryonic maldevelopment, abnormal peristalsis, and deranged nerve function. Histological examination is of little value in ruling out antecedent infection unless it is performed within forty-eight hours after the occurrence of the torsion. However, as salpingitis is usually associated with a certain amount of oöphoritis, the author believes that in doubtful cases the question of preceding inflammation of the tube can be decided by histological examination of the ovary.

The sequelae of tubal torsion may be (1) spontaneous cure by untwisting with possible recurrences, (2) chronic recurrences followed by eventual amputation, or (3) complete or partial spontaneous amputation.

HAROLD C. MACE, M.D.

Buettner A.: Ovarian Tumors and Masculinization. The Arrhenoblastoma of Meyer (Ueber Eierstockgeschwächste mit Virginalbildung. Arrhenoblastome R. Meyers) *Arch. f. path. Anat.* 1932 CXIV:471, 472.

Buettner summarizes in a table the 25 cases of arrhenoblastoma ovarii which have been reported to date. The tumors are divided into the following three groups:

1. The adenoma tubulare (testiculare) of Pick (a) mature, (b) partially carcinomatous.
2. A middle group with typical and atypical tubular elements and solid elements.
3. Atypical tumors (a) predominantly solid, with atypical tubular elements, (b) solid.

Following a description of the morphological and clinical peculiarities of the growths, Buettner reports two cases from the service of Esan. The first was that of a woman sixty-six years of age who had one living daughter. The patient stated that her mother had had a very pronounced beard but very thin hair on her scalp. Since her fortieth year the patient had had amenorrhea and a marked growth of hair on the face and body. Esan reported this case before the ovarian tumor could be demonstrated. Following an observation period of three years the patient was operated upon for incarceration of a myomatous uterus and died three weeks later. The left ovary which was removed at operation, was about the size of a pigeon egg and grayish-white. Its cut surface was brownish-red, damp, and very soft. Beneath the narrow poorly delimited ovarian cortex could be seen a predominantly solid epithelial tumor with strand like villous and tubular portions. This carcinoma-like neoplasm was very different from the usual carcinomas of the ovary. It contained no teratomatous elements. On the whole,

the structure differed basically from that of a hypernephroma. There were no fatty substances and no lipoids. The tumor most closely resembled the neoplasm in Sellheim's case, showing only minor differences such as giant-cell formations and a papillary structure. The endometrium was atrophic to an unusual degree.

Of the twenty-five cases of arrhenoblastoma reviewed, myomata were found in five. The tumor in the case reported by Sellheim and in the Bingel-Schultz case most closely resembled the tumor in the case reported by the author as regards atypical structure.

The second case reported by Buettner from Esan's service was that of a para lili twenty-six years old who was in the eighth month of pregnancy and had had a marked growth of hair on the chin since the first month of pregnancy. Operation performed ten days after delivery disclosed two large growths at the sites of the ovaries, a small tumor in the omentum, and the presence of ascites. Four months later the beard had disappeared. On histological examination, the tumors showed numerous epithelial strands of vesicular "seal-ring-like" cells. They were diagnosed as Krukenberg tumors secondary to a gastric cancer. Eighteen months after the operation a recurrence developed—an inoperable gastric carcinoma with omental metastases (adenocarcinoma). The adrenals were not examined as permission for autopsy could not be obtained.

In conclusion the author says that there is thus far not a single satisfactorily studied case which supports Halban's theory. Nevertheless we must still bear in mind the possibility that tumors other than the arrhenoblastoma in the ovary may also cause masculinization.

R. MEYER (G)

Moeuch, L. M.: A Clinical Study of 483 Cases of Adenocarcinoma of the Ovary: Papillary Cystadenoma, Carcinomatous Cystadenoma, and Solid Adenocarcinoma of the Ovary. *Am. J. Obst. & Gynec.*, 1933 xxvi, 22.

This study includes all cases of clinically malignant adenoma of the ovary considered operable in which operation was performed at the Mayo Clinic in the period of eleven years from January 1917, to December, 1927, inclusive. Extensive recurring carcinoma and abdominal carcinomatosis considered inoperable in cases in which only exploration was undertaken were excluded.

Adenocarcinoma of the ovary is most frequent in the fifth and sixth decades of life. The average age of the patients with papillary cystadenoma was forty-six and nine-tenths years, of those with carcinomatous cystadenoma, forty-six and seventy-three hundredths years and of those with solid adenocarcinoma, forty-eight and thirteen hundredths years.

There are no characteristic symptoms of adenocarcinoma of the ovary. Abnormality of ovarian function was manifested by disturbances of menstruation.

Of 388 patients who were traced 59.70 per cent were living and 40.20 per cent were dead at the time of the follow-up three or more years after the operation. The proportion dead was lower among patients who had papillary cystadenoma than among those who had carcinomatous cystadenoma or solid adenocarcinoma.

Of the tumors without metastasis, 24.81 per cent were bilateral. The proportion of patients who were dead was larger among those who had bilateral growths than among those who had unilateral growths. The length of life after operation tended to be shorter in cases of bilateral growths than in those of unilateral growths.

The mortality was 22.22 per cent in the cases in which only one ovary was removed and 20.89 per cent in those in which both ovaries were removed.

Intracystic malignancy was less likely to recur than extracystic malignancy. The mortality from recurrence of intracystic growths was 25.53 per cent, and that from recurrence of extracystic growths 28.20 per cent.

In cases of ruptured pseudomucinous cystadenoma with peritoneal involvement the mortality was high. Of the patients with ascites, 56.96 per cent were dead at the time the study was made. Of the patients without apparent metastasis, the proportion living was higher than the proportion living of those with apparent metastasis. Of the patients with metastasis, 30.39 per cent were living at the time the study was made. The proportion of patients living at the time the study was made was higher among those who had pelvic metastasis only than among those who had both pelvic and abdominal metastasis.

Lissowsky, V.: The Question of So-Called Carcinoma of the Corpus Luteum (Zur Frage des sogenannten Carcinoma des Corpus luteum). *Arch. f. path. Anat.*, 1933 cclxxxviii, 297.

The author reports an ovarian tumor which occurred in a woman forty-six years old. Menstruation was normal. The patient had two living children. Bilateral ovarian tumors and a metastasis in the broad ligament were removed. Death occurred five months later from cachexia and multiple metastases. On microscopic examination one of the tumors was found to consist of elements which resembled luteal cells.

On the basis of his researches, the author comes to the following conclusions:

1. Every tumor and especially every malignant tumor must be regarded as the local manifestation of a special condition of the organism. Especially malignant neoplasms must be studied both morphologically and pathophysiologically (clinically) in their relationship to the host to the organism as a whole (phenotype and genotype) which is affected by its particular environment (mode of living, occupation).

2. Among the neoplasms of the ovary (an endocrine gland) those which consist of cells morpho-

logically similar to the components of the corpus luteum constitute a distinct group.

3. Fat staining of such tumors shows that their cells contain lipoids. In the case reported microchemical and microphysical studies demonstrated that the lipoids in both the tumor cells and the surrounding framework were phosphatids.

4. As the tumors are formed by immature cells which contain phosphatids and are proliferating rapidly their origin is apparently related to the earliest stages of development of the corpus luteum and such tumors probably have no influence upon either the uterus or menstruation.

5. The unusual malignancy of such tumors is to be attributed to their origin from the cells of the corpus luteum in the first stage of their development, i.e. from cells which are very immature and possess the ability to proliferate extensively.

6. Tumors formed from the embryological primitive tissues of the organs of internal secretion are always peculiar. They possess a secretory function and are apparently not true tumors. They should be classified in a distinct group and given a common name such as strumata. The tumor to the case reported may be best described as a "struma ovarii luteocellulare maligna, bilaterale."

HANS OTTO NEUMANN (G)

EXTERNAL GENITALIA

Jeanbrau, E. Five Difficult Vesicovaginal (Fistulae Cured by Vaginal Operation in the Depage Position. (Cinq fistules vesicovaginales difficiles guéries par l'opération gynécologique en position de Depage) *J. d'urét. et d'obst.* 1933, XXXI, 221.

The author operates for vesicovaginal fistula with the patient placed on her abdomen with the sacrum elevated the so-called Depage position. In this position the anterior vaginal wall is well exposed. In addition to this position, certain other technical precautions are necessary to assure a successful result. The most important is a suprapubic cystostomy as the first step of the operation introduced by Marion. To keep the operative field as dry as possible, the author sponges the bleeding tissue with small tampons saturated with a 1:1,000 solution of adrenalin.

Following a detailed report of five cases of obstetrical vesicovaginal fistula which he cured by operation, Jeanbrau draws the following conclusions:

1. Vesicovaginal fistulae due to operation (hysterectomy) should be operated upon by the transperitoneal route (Dittel-Forgue technique) or the transperitoneo-transvesical route (Legueu technique).

2. High obstetrical fistulae are operated upon best by the transvesical route (Marion technique).

3. Low obstetrical fistulae should be operated upon by the vaginal route with the patient in the Depage position which facilitates the operation and favors a successful result.

ISAAC ANDERSON, M.D.

MISCELLANEOUS

Jayle, F.: Parthenology or the Study of Diseases of the Genital Tract of the Virgin (La parthénologie ou l'étude des maladies de l'appareil génital chez la vierge) *Comptes rendus Soc. franç. de gynéc.* 1911, III, 13.

Diseases of the genitalia of the virgin are not infrequent. They have the peculiarity of being based largely on congenital malformations, dysfunction of the ovaries or other glands of internal secretion and the general physical condition. Infection is of secondary importance in their development.

Although a complete examination is essential for accurate diagnosis, it appears that pelvic examination is often omitted. The author reports cases to show the gross errors in diagnosis and treatment that may result from failure to make a pelvic examination.

Among the symptoms of pelvic disease in virgins is leucorrhoea. This is never mucinous, but usually milky yellow or green. As a rule there are irregularities of menstruation. Pain is quite uncommon.

The lesions which have been observed and are described include stricture of the internal os, hypertrophy and ulceration of the cervix, endocervicitis, uterine displacements, genital hypoplasia, and hyperplasia of the endometrium. The endometrial hyperplasia is often polypoid and may have a definitely neoplastic structure. It may be complicated by infection. The author believes that congenital lesions are as frequent in the female as in the male, but that in the female minor lesions are often undiscovered.

Jayle warns against assuming that all discharges in recently married women are gonorrhoeal, as the history will often reveal that the discharge has been present for years and has been merely aggravated by marriage.

In the discussion of this report COLANIERI stated that gynecological diseases of the virgin constitute an almost untouched field. He believes that infection plays a more important rôle in their development than Jayle ascribes to it.

JULIEN said that he also regards infection as an important factor. The organisms most commonly found are the colon bacillus, the staphylococcus, and the enterococcus.

DOUGLAS cited a case of carcinoma in a girl fourteen years old which, when discovered, had reached an inoperable stage because of the reluctance of the attending physician to make an examination through the hymen.

ALBERT F. DE GROOT, M.D.

Burger, P.: Postmenopausal Bleeding and Exploratory Curettage (A propos des hémorragies après la ménopause et du curettage exploratoire) *G. Gynéc.* 1933, XXXII, 199.

The author was prompted to make the study herewith reported by articles published by FAURE and

Ducuing in 1930 and 1931 in which the practice of diagnostic curettage in cases of postmenopausal bleeding was condemned. The reasons given were as follows:

1. Curettage is useless because in most cases, postmenopausal bleeding is readily recognized clinically as being due to carcinoma.

2. Even though carefully performed, curettage may not include small malignant areas.

3. Delay pending histological examination of curettings is costly.

4. Perforation of the uterus and uterine infection are not uncommon accidents.

5. Hysterectomy is preferable because after the menopause the uterus is a useless organ and therefore should be removed if it is at all diseased even when it is not frankly cancerous. Immediate hysterectomy (especially by the vaginal route) provides immediate relief and efficient cancer prophylaxis with minimal risk.

From a study of ninety cases of postmenopausal bleeding observed over a period of four years Burger draws the following conclusions:

1. Except in cases of cervical carcinoma malignancy is not the most common cause of postmenopausal uterine bleeding. In the cases reviewed the incidence of malignancy was only 37.05 per cent as compared with the incidence of 61 per cent reported

by Ducuing and the incidence of 90 per cent estimated by Faure.

2. Even though malignancy was not the most common cause in the cases reviewed every case of postmenopausal bleeding should be considered due to carcinoma until this condition is ruled out.

3. Early diagnosis with the aid of exploratory curettage followed by appropriate early treatment by operation or irradiation is the only means of obtaining good results.

4. In the majority of cases exploratory curettage is the only means of arriving at an exact diagnosis. It is an indispensable aid in gynecological practice and permits the surgeon to proceed with full knowledge of the condition he is treating. Accidents resulting from curettage are too rare to necessitate abandonment of the procedure.

5. Of 325 cases of uterine hemorrhage occurring during the menopause carcinoma of the cervix was found in only 1.77 per cent and carcinoma of the fundus in 3.7 per cent. Carcinoma of the fundus is therefore an important factor during, as well as before, the menopause. Curettage and histological examination of curettings offer the only exact means of early diagnosis and will reduce the number of unnecessary hysterectomies which are performed for benign causes of uterine bleeding.

HAROLD C. MACK, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Young, A. M., and Hawk, G. M.: Primary Ovarian Pregnancy. *Am J Obs & Gynec* 933 xlvii, 97

Three weeks after her last menstrual period the author's patient bled vaginally for seven days. She was nauseated and had painful breasts. Twenty-two days later she experienced excruciating low abdominal pain which rapidly extended upward across the abdomen to the subcostal region. She was nauseated, but did not vomit. On her admission to the hospital seven hours later she showed typical signs of an ectopic pregnancy. At operation the right ovary and tube were found fixed in the cul-de-sac. The ovary contained a large hemorrhagic mass containing a small fetus. The patient recovered in ten days.

When the ovary was reconstructed it formed a roughly spherical mass measuring approximately 5 by 4 by 4 cm. Along the external surface of the mass there was grossly recognizable ovarian tissue with a characteristic corpus luteum measuring approximately $2\frac{1}{2}$ cm. in long diameter. The collar of yellow lutein tissue was approximately 4 mm. in width. The corpus luteum overlay a mass of reddish brown friable tissue grossly suggesting placenta and blood clot which in part occupied the cavity of the corpus luteum. In the central portion of the mass of placental tissue there was a fetal sac about 3 cm. in diameter which was lined by smooth transparent membranes. The fetus was separate from the sac and well formed although somewhat macerated. It measured 50 mm. from crown to rump and 26 mm. full length these measurements corresponding to those of an intra-uterine fetus from fifty to sixty days old.

The microscopic sections, which confirmed the diagnosis, disclosed a decidua like tissue in the ovary.

EDWARD L. CORRELL, M.D.

Schlossmann, H.: The Exchange of Material Between Mother and Fetus Through the Placenta. (Der Stoffaustausch zwischen Mutter und Frucht durch die Placenta). *Ergebn & Physiol* 1933 xxiii, 741

The author begins with the old debated question as to whether the placenta, which, in the mammal, provides for the exchange of material between the mother and fetus, acts only as a passive layer of separation between the maternal and fetal blood or has an active function of some sort which makes possible the passage of certain substances from the maternal to the fetal blood and vice versa. To answer this question, the following subjects are discussed: the morphology of the placenta, the ways by which material is exchanged between the mother

and fetus, the metabolism of the placenta, the reaction of the blood vessels of the placenta and the umbilical cord to stimuli, and the experimental methods for the investigation of the exchange of material through the placenta.

With regard to the exchange of material through the placenta the author discusses the exchange of gases between mother and fetus, the consumption of oxygen by the fetus, the passage of carbohydrates, protein, lipoids, and fat through the placenta, and the permeability of the placenta to hormones, vitamins, salts, and other normal elements of the maternal and fetal blood and to alien substances.

The conclusions drawn are as follows:

There are many substances which pass through the placenta from the mother to the fetus and vice versa by diffusion or filtration. The passage of no single substance through the placenta can be explained merely by the assumption of a vital function of the chorionic epithelium. The stage of development of the placenta influences the exchange of material only as regards the time it requires. It is logical to assume that the entire exchange of material between the mother and the fetus takes place through the placenta as a physical process without any vital co-operation on the part of the chorionic epithelium. It depends only upon the physical conditions whether or not any substance can penetrate through the human or mammalian placenta. An emphatic stand is taken against Hofbauer's theory of an active co-operation of the vital powers of the chorionic epithelium in the exchange of substances between the mother and fetus. Attention is called to the fact that certain substances undoubtedly pass from the maternal circulation into the fetal circulation by diffusion or filtration. For the passage of other substances which cannot be explained in this way Hoeber suggests the term 'physical permeability'. According to his theory non lipid-soluble substances pass through the pores between the individual cells of the membrane while lipid-soluble substances are taken up by the lipid portions of the cell membrane. For the electrolytes as well as for all dissociated substances, differences in the electrical charges of the cellular borderlines instead of lipid solubility and molecular size are the important factors. Under certain conditions these differences may explain even the process of the directed permeability that is, permeability in only one direction. Therefore, if physical processes, which are based ultimately on labile bio-electrostatic conditions of balance or displacement, are considered as being produced by vital powers, then, in this sense, the placenta and chorionic epithelium respectively have vital powers also. However these powers are by no means organ-

specific, but are inherent in every cell layer of the organism. ROSENBERG (G)

Siddall, R. S., and Mack, H. C.: Weight Changes in the Last Four Months of Pregnancy. *Am J Obst. & Gynec.* 1933 xxvi, 244

Weight changes calculated from periodic observations during the last four months of pregnancy showed many and extreme variations from the average. Parity and body build (height weight ratio) was of little or questionable influence in the causation of these variations. Age had some effect (younger women gaining more than older women) regardless of parity and body build but failed to explain the majority of the deviations from the average.

An excessive gain at some period or periods was noted in the majority of cases of late toxemia of pregnancy. It occurred before the onset of definite signs in two-fifths of the cases of toxemia but was found to occur with the same frequency also in normal pregnancy.

Therefore in the relatively small series of cases studied an excessive gain in weight was of questionable value in the early recognition of impending toxemia. EDWARD L. CORNWELL, M.D.

Kühnel P. Placental Chorio-Angioma. *Acta obst. et gynec. Scand.* 1933 xiii, 143

In a review of 163 cases of placental chorio-angioma collected from the literature the author found that the condition occurs once in 900 pregnancies. The tumor may be as small as a hazelnut or as large as a child's head, but as a rule it ranges in size between that of a walnut and that of a man's fist. In 87 of the cases reviewed it was on the fetal surface of the placenta. In 18 it was marginal. In 14 it was embedded in the substance of the placenta. In 18, it protruded on the uterine surface and in 18 it was connected with the placenta merely by a vascular stem. The location of the tumor and the frequency of involvement of the various sites are shown in tables.

Multiple chorio-angiomas in the same placenta are rare.

In the presence of a chorio-angioma the weight of the placenta is high. In 15 of the cases reviewed it was greater than 1000 gm. The maximum weight on record is 1850 gm.

The morphology and histology of chorio-angiomas are discussed. According to the definition given by Cohnheim, chorio-angiomas are true tumors.

Various problems with regard to the etiology and pathogenesis of chorio-angiomas are discussed. In this connection the 18 pedunculated chorio-angiomas reviewed are of particular interest as they appear to support the theory advanced by Albert in 1868 that chorio-angiomas originate very early in the embryonic stage.

The age of the woman does not appear to be a factor in the appearance of chorio-angiomas.

Chorio-angioma is associated with hydramnios so often (in 41 of the 163 cases reviewed) as to suggest some connection between the two conditions.

Hydramnios, premature rupture of the membranes, weakening of the pains, atonic postpartum hemorrhage, and less frequently retention of a pedunculated chorio-angioma in the uterus considerably increase the risk of morbidity in cases of chorio-angioma.

The prognosis for the child is decidedly less favorable in cases of chorio-angioma as one-third of the children are stillborn or so premature that they die within a few days after birth.

In conclusion the author reports 8 cases of his own.

Campbell R. E. Pregnancy and Labor Complicated by Myomatous Tumors of the Uterus. *Am J Obst. & Gynec.*, 1933 xxvi, 1

The incidence of myoma in 32,870 pregnant women was 0.43 per cent (142 tumors). Eighty two of the 142 fibroid tumors, were of sufficient importance to complicate pregnancy labor or the puerperium. The tumors were more common in colored women than in white women, and in primiparae than in multiparae. They were found most frequently in women between the ages of thirty five and forty five years.

Sterility, premature labor and immature birth were closely associated with the complication. There is doubtless a relationship between uterine myomatous tumor and sterility. Immature birth and premature labor occurred in 25 per cent of the cases. Mild discomfort was noted during the pregnancy. Severe symptoms frequently necessitated obstetrical and surgical procedures. Labor was often tedious, painful, and prolonged. Early rupture of the membranes occurred in 37 per cent of the cases and disturbing hemorrhage in 31 per cent. Adherent placenta was found in 8 cases. In 26 cases there was poor involution of the uterus. Infections were not uncommon. Major surgical operative interference was necessary in 31.6 per cent of the cases, and obstetrical operative procedures were carried out in 14.6 per cent. The total incidence of operative procedures was 46.2 per cent. Necrosis was found in 75.8 per cent of the tumors removed during pregnancy and 78.1 per cent of those removed from non-pregnant women. Campbell believes that infection is not sufficiently emphasized in the literature as an added danger in cases of pregnancy complicated by fibroids.

The gross fetal mortality in the cases reviewed was 28 per cent, the gross fetal mortality in cases treated surgically 33 per cent and the gross maternal mortality 3.65 per cent.

A better understanding of the obstetrical principles involved in the complication of pregnancy by fibroid tumors has led to improvement in the treatment of the condition. In certain cases delivery by the surgical operative route, notably cesarean section or cesarean section and hysterectomy is

substituted for an attempt at delivery by the vagina. A clearer conception of the relative importance of necrosis and infection and early recognition and proper treatment of both have saved many lives. The ability to evaluate and treat less serious, though important, complications, such as early rupture of the membranes and uterine inertia and subinvolution, and the prevention of unnecessary obstetrical manipulation have greatly improved the prognosis.

EDWARD L. CORSELL, M.D.

Orley A. The Evolution of X Ray Pelvimetry. *Brit. J. Radiol.* 1933 vi, 345.

Orley reviews the eight methods of X-ray pelvimetry, which have been used since the first roentgenogram of the pelvis was made by Vanier and Chappuis in 1896. The methods are: the comparative, the teleroentgenographic, the mathematical, the stereoscopic, the method based on the principles of localization of foreign bodies, Albert's method, the frame method, and the lateral method.

The mathematical method is simple and accurate, but because of the calculation involved has not been popular. Albert's method, in which the plane of the pelvic brim is brought parallel with the X-ray plate, has a very small possible maximum error. Thoms has worked out a modification of the frame method and has suggested that the roentgenogram be made from the lateral angle. Orley believes that this technique will give good results so far as the diagonal conjugate is concerned. In Thoms' method the distance between the tip of the fifth lumbar vertebra and the X-ray table is measured by means of a caliper; the height of the symphysis is measured by means of a lump-bob hung from the tube; and the pelvis is roentgenographed with the patient in a semi-reclining position. The patient is then removed and a calibrated lead plate is placed in the plane of the pelvis as defined by the callipers and the plumb bob and a flash exposure is taken.

HENRY S. ACCELY JR., M.D.

Voron, J. and Pigeaud, H.: The Syndrome of Severe Albuminuria With Hydrops During Pregnancy (Syndrome d'albuminurie à forme hydropisique à cours de la gestation). *Gynec. et obs.* 1933 xiv, 189.

In a period of six years the authors observed six cases of albuminuria associated with chloride retention and extensive edema during pregnancy. The blood pressure and the blood nitrogen were always normal. The cause could not be determined as none of the patients presented evidence of long standing renal damage. In two cases the albuminuria recurred during two successive pregnancies. In one case, because of repeated abortions, syphilis was suspected. In general, however, the syndrome differed from the albuminuria and edema in cases of normal pregnancy without evidence of preceding renal impairment only in the degree of the albuminuria and edema. Toxic symptoms characteristic of pre-eclampsia and eclampsia (headache,

vomiting, visual disturbances, and sensory disturbances) were noted in three cases. In one of them, severe convulsions occurred ten days prior to delivery. Recovery from these symptoms was rapid following delivery and all of the patients left the hospital in good conditions entirely free from edema and with the albuminuria greatly diminished.

The authors are of the opinion that the symptoms of eclampsia are due to chloride retention. These symptoms are much less severe in cases without hypertension and increased blood nitrogen than in those with albuminuria associated with hypertension. In the cases reviewed delivery occurred prematurely (more than fifteen days before term). The premature infants were markedly underweight, but were born alive and left the hospital in good condition. In two cases in which delivery took place near term, the infants were stillborn, one occurring before, and the other during, delivery. Since four of six infants were born alive, the authors conclude that the prognosis for the child is not particularly grave in these cases. However they believe that labor should be induced prematurely as prolongation of the pregnancy is a hazard to the fetus.

HAROLD C. MACK, M.D.

Kulka, E.: Further Investigations Regarding Bacteremia During Normal Pregnancy and Early in the Afebrile Puerperium (Weitere Untersuchungen zur Frage der Bakteriämie während der normalen Geburt und im afebrilen Fruchtwochenbett). *Arch. f. Gynäk.* 1932 ciii, 151.

The author previously reported that bacteria can be demonstrated in the blood stream in about 18 per cent of cases of normal afebrile delivery. Recently he repeated the experiments, making cultures of the maternal blood and of blood from the umbilical cord in sixty-two unselected cases. Bouillon and blood-agar plates were used. On the second day the bouillon cultures were replanted and the organisms found were differentiated.

Control media similarly incubated and cultures made on the third day after delivery remained sterile. The blood of the mother was positive in thirty-one (50 per cent) and the blood of the infant was positive in twenty-seven (43.5 per cent), of the cases. The organisms found in both bloods were hemolytic and non-hemolytic streptococci, colon bacilli, Gram-positive diplococci and some unidentified bacilli.

E. FRIEDLÉ (G)

LABOR AND ITS COMPLICATIONS

Léon, J. and Diradourian, J.: The Action of Injections of Quinine on the Uterus During Labor (Acción de las inyecciones de quinina sobre el útero en trabajo). *Spanish Med.*, 1933, xi, 1903.

The authors review the conflicting opinions on the oxytocic action of quinine and report a clinical experimental study by the method of external hysterography. Sixteen women (primiparae and

multiparae) from eighteen to forty years of age were given quinine sulphate or hydrochloride intramuscularly. The total amount of the drug never exceeded 0.75 gm. Kymographic records were made before and for a variable period after the injection. In some cases they were made until the placenta was expelled. The cases included normal labor, premature rupture of the membranes, primary and secondary inertia, irregular rhythm, and marked oscillation of the uterine tonus. Cases of decided hypertonicity were excluded. The histories are reported in detail and in tabular form and the tracing in each case is presented.

The results show that, on the whole, quinine has only an insignificant influence on the dynamics of the uterine body. In some cases there was a slight increase in the intensity, frequency and regularity of the contractions, but in other cases no effect was apparent. The graphs did not show the descent of the abscess which is considered by some French obstetricians characteristic of the effect of quinine.

On the other hand, in more than half of the cases the quinine caused the cervix to dilate with considerable rapidity as if it had an antispasmodic action. When dilatation was progressing very slowly it proceeded quickly after the injection.

The results agreed with the recognized inconspicuity of the action of the drug and the general opinion that it is efficacious only when labor is somewhat advanced. When the contractions were particularly irregular and the oscillations of tonus were accentuated, the quinine was almost always ineffective or disturbed the dynamics even more and affected the fetus unfavorably. During the expulsive period, pituitary preparations are far superior. In the third stage the quinine caused poor contraction of the uterus with relative frequency. These experiments do not authorize the use of the drug in hypostole with accentuated hypertonicity, we have other much more adequate resources for this condition.

In summarizing their report the authors state that quinine is indicated during dilatation in cases of relative or absolute insufficiency and in dynamic anomalies characterized by slight spasm of the cervix. The investigation reported demonstrated once more the value of the graphic method in the study of uterine dynamics with special reference to the action of drugs.

The article has a comprehensive bibliography.
MARY ELEANOR MOORE, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Rivett, L. G., Williams, L., Colebrook, L., and Fry, R. M. Puerperal Fever. A Report upon 533 Cases Received at the Isolation Block of Queen Charlotte's Hospital. *Proc Roy Soc Med Lond.*, 1933, xxvi, 1161.

The cases of puerperal fever reviewed by the authors included cases registered in the inpatient and out patient services, emergency cases, and cases sent in after delivery. The incidence of serious in-

fection was higher among the registered patients delivered at home than among patients of the same class delivered in the hospital. Nearly 50 per cent of the patients admitted to the hospital had had normal deliveries. The mortality in this group was just under the average for the whole series.

The authors believe that puerperal sepsis originates as a local wound sepsis and that early diagnosis of the site of the local sepsis and careful bacteriological study will considerably reduce the mortality. When the lesion can be confined to one locality there is no mortality but when the infection spreads to the peritoneum or blood stream (either as septicemia or thrombophlebitis) the mortality is very high. However in many cases peritonitis or thrombophlebitis may be present without causing clinical symptoms which may be considered pathognomonic. Thrombophlebitis seems to be associated particularly with an anaerobic streptococcal infection. The mortality of septicemia varies with the organism present. It is highest, 86 per cent, when the septicemia is due to the streptococcus, and lowest, 20 per cent, when the septicemia is due to the colon bacillus. The authors believe that in most instances septicemia is secondary to peritonitis or thrombophlebitis, and that constant re-infection from such a source nullifies the use of blood-stream antiseptics.

As treatment for peritonitis, they advocate very early drainage following a diagnosis made by examination of peritoneal exudate obtained through a small abdominal incision.

HENRY S. ACKER, JR., M.D.

Colebrook, L., and Hare, R.: The Anaerobic Streptococci Associated with Puerperal Fever. *J Obst & Gynaec Brit Emp*, 1933, xl, 609.

The authors studied a large number of anaerobic streptococci isolated from the uterus and the blood of women with puerperal sepsis. Their method of culturing which is described in detail, obtained strictly anaerobic streptococci from the blood of forty women and pyogenic streptococci from the blood of sixty two women.

Bacteriological and serological studies showed that two types of anaerobic streptococci or one type of anaerobic streptococci and other organisms were frequently present at the same time in the circulating blood. Streptococcus pyogenes was seldom associated with anaerobic streptococci in these multiple blood infections.

When the alkali reserve of the serum was abolished or reduced or when the antityptic power of the serum was neutralized the anaerobic streptococci grew luxuriantly.

After the third day of the puerperium the serum toxemia showed a markedly reduced alkali reserve or an actual acidity and a loss of antityptic power. These changes allowed luxuriant growth of the anaerobic streptococcus. The acidosis in the tissues which favors bacterial growth may be explained by

the ischaemia of the uterine wall occurring during the first week of the puerperium.

On the basis of colonial characteristics, four chief types of anaerobic streptococci were identified. Two types occurred frequently and two infrequently. Biochemical and serological tests were of no value in differentiating the anaerobic streptococci, but the authors believe there were probably a number of serologically distinct types. A. F. LAM, M.D.

Oldfield, C. and Pirrah, L. N.: Observations on the Pathology, Diagnosis, and Treatment of Puerperal General Peritonitis. *Proc. Roy. Soc. Med. Lond.*, 1935, xxvi, 175.

The authors review a series of thirty-six cases of peritonitis following puerperal fever. Twenty-five of the women died and eleven recovered. All but seven were operated upon. Those not operated upon were moribund when they entered the hospital. The operation consisted of drainage through a large incision

in the abdominal wall with, in a few instances, supplementary drainage through the cul-de-sac. Peritonitis occurred more frequently after labor than after abortion.

When the peritonitis develops during the first four days after labor the infection is severe and usually fatal. When it develops later there is hope of localization and consequently a good result.

The physical signs may be comparatively slight except for gradual deterioration of the general condition. No symptom can be considered pathognomonic.

The authors regard early drainage of the peritoneal cavity as an important factor in the cure of the disease. They do not advise hysterectomy. They state that local foci of infection in the pelvis should be packed off and then incised for evacuation of the pus. They believe that puerperal peritonitis is more often a local disease than a terminal condition in septicemia. HENRY S. ACHES, Jr., M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Luccioni, F.: A Study of the Combined Approaches in Wounds and Contusions of the Spleen and Left Kidney (*Étude des voies d'abord combinées dans les plaies et dans les contusions de la rate et du rein gauche*) *Arch. d. mal. d. reins et d. organes génito-urinaires* 1933 vii, 307

The combination of severe injuries of the spleen and left kidney is extremely serious, the mortality ranging from 50 to 75 per cent. The signs of splenic lacerations are variable. Most important are the evidences of shock and blood loss. Added to these are tenderness and spasm of the abdominal wall and fullness or dullness in the left flank from the collection of blood therein. Injuries of the kidneys are generally manifested by the early appearance of hematuria. Combined injuries of the spleen and left kidney may be associated with injuries of other viscera.

In the approach to a combined injury to the spleen and left kidney the incision should be simple but must give adequate room for exploration and so placed that it may be easily extended if necessary. The nerve supply and muscles of the abdominal wall should be spared as much as possible. A median abdominal incision conserves the nerves of the abdominal wall to the greatest extent and permits easy exploration of the abdomen. If its lower end is prolonged laterally or toward the tenth rib it gives a very adequate approach which will permit operative procedures on the spleen, kidney, colon, stomach, and diaphragm. When the damage appears definitely limited to the spleen and kidney a dorsolumbar incision provides adequate exposure with maximal conservation of the muscular structures.

If the spleen is lacerated and contused, its removal is the only justifiable procedure, but injury to the kidney should always be treated conservatively. Renal lacerations may be sutured or a heminephrectomy may be performed. As a rule it is necessary to drain the kidney pouch.

In combined injuries of the spleen and left kidney operation is always necessary. The mortality of expectant treatment approaches 100 per cent.

JOHN W. EYRON M.D.

Bonaccorsi, A.: Hydronephrosis and Lithiasis in a Pelvic Ectopic Kidney With Pelvic Ureteral Malformation (Idronephrosi e litiasi in rene ectopico pelvico, con malformazione pielo-ureterica) *Poliklin.*, Rome 1933 xl, sec. chir. 245

The case reported was that of a girl thirteen years of age who five years previously began to complain of pain of a colicky character in the lower part of the abdomen on the left side and passed blood in the

stools. Roentgen examination revealed a redundant sigmoid, a diffuse spasm in the descending colon, and a small oval shadow behind the sigmoid which was interpreted as a nucleus of ossification in the sacrum. A few months later another X-ray examination led to a diagnosis of vesical calculus. At operation, the bladder was found completely normal.

When the patient was first seen by the author the attacks of pain were more severe than before, and deep palpation disclosed pain in the left iliac fossa. The kidney regions showed nothing abnormal. The urine contained only a few leucocytes. X-ray examination supplemented by cystoscopy, chromocystoscopy, and descending urography led to a diagnosis of pelvic ectopic kidney with a ureteral calculus and marked angulation of the ureter. The left kidney was removed through an iliac inguinal incision. Section of the kidney revealed a hydronephrosis which was probably secondary to disturbances of the circulation due to the anomalous blood supply of the kidney and obstruction from the kinking of the ureter.

EDWARD T. LINDY M.D.

Pfeiffer, A.: Pyelonephritic Contracted Kidney (Über die pyelonephritische Schrumpfkulere) *Zuckerf. f. urol. Chir.*, 1932 xxvii, 53

The author states that the pyelonephritic contracted kidney has received very little consideration in the past, even in the larger textbooks. He endeavors first to answer the question as to the rôle it plays in comparison with other types of contracted kidney and whether it occurs more or less frequently than the other types. Of 970 autopsies performed during the year 1930 he found arteriosclerotic contracted kidneys in 27 (2.78 per cent) and pyelonephritic contracted kidneys in 18 (1.85 per cent). His conclusions are based on these 18 cases: 5 specimens sent to him, and 5 cases reported by Staemmler and Dopheide.

Of the first 23 cases cited, 17 were those of women and 6 those of men. The ratio of women to men was therefore about 3:1. Eleven of these cases were unilateral and 12 were bilateral. In 9 cases the pyelonephritic contracted kidney was the direct cause of death or was responsible for death indirectly as the result of apoplexy, sepsis, or some other complication. In 3 cases it was a definite cause of illness, but was not the cause of death. In 8 cases it produced no symptoms.

The author reviews the pathological anatomy and microscopic findings in cases of pyelonephritic contracted kidney with the aid of case histories and photomicrographs.

A characteristic change in this condition is dilatation of the renal pelvis. However this is never sufficient to cause atrophy of the kidney tissue. Nearly every

pyelonephritic contracted kidney has a different external as well as internal appearance. With regard to the findings of microscopic examination, Pfeiffer says that while he recognizes the 4 stages described by Stenkmiller and Doppeide, considerable overlapping occurs.

The clinical findings are discussed in detail. The author states that as the picture presented is always that of a far-advanced condition conclusions as to its cause require great caution. He believes that pyelonephritic contracted kidney is probably due to an ascending process such as has been assumed with certainty to be responsible for contracted kidneys with stone formation.

J. J. J. (Z)

Wolgensinger Masked Renal Tuberculosis and False Renal Tuberculosis (*Bacillus renal masqué et fausse bacilliose rénale*) *J. d'uról. méd. et k.* 1933 LXV 289.

Two unusual conditions are described in detail (1) renal tuberculosis masked by pyelonephritis and cystitis which may be evidenced by an enterorectal syndrome, and (2) ordinary pyelonephritis which presents the symptoms and the cystoscopic findings of renal tuberculosis.

Two illustrative cases of the first condition are reported. The disease begins as an ordinary pyelonephritis with pyuria and dysuria. The cystoscopic findings are variable, but do not suggest a specific cause. Cultures are positive for colon bacilli. The condition is usually diagnosed first as pyelonephritis and treated accordingly. Failure of this treatment leads to a revision of the diagnosis and a search for factors which might maintain the infection. The elimination of such possible causes as prostatic hypertrophy, diverticula, calculi, and tumor finally leads to the suspicion of latent tuberculosis. The separate examination of the functional capacity of the kidneys is of especial aid because tuberculosis causes a relatively greater depression of function considering the extent of the lesions, than any other disease.

Of the second condition described, four illustrative cases are reported. This condition is characterized by an enterorectal syndrome which begins insidiously and is associated with ulcers of the bladder closely resembling tuberculous ulcers. The causative organism is usually the enterococcus. The absence of definite intestinal symptoms, the remissions and exacerbations, the change in the general health, and the intolerance of the bladder to silver nitrate lead to a fruitless search for the tubercle bacillus. A general urological examination may reveal the source of the trouble. In one case, dilatation of the ureters and renal pelvis was found. Often, however, the possibility of tuberculosis cannot be eliminated. When no treatment or improper treatment is given the disease may persist for months or years. In two of the author's cases its duration was four years. Rather characteristic is its amenability to proper treatment, namely treatment of the enterorectal syndrome. This varies in

different cases. The definite demonstration of the enterococcus in the urine is of great diagnostic aid because this organism alone is capable of producing lesions which simulate those of tuberculosis.

ALBERT F. DE GRANT, M.D.

Cirio, G.: Multiple Angioma of the Bladder and Kidney (*Angiomi multi della vescica e del rene*). *Riforma med.*, 1933 LVII, 598.

A man twenty three years of age came for examination on account of repeated hematuria. General physical examination disclosed a cavernous angioma the size of a bean on the external border of the right ear and cystoscopic examination disclosed a similar angioma the size of a strawberry on the left wall of the bladder. Destruction of the tumors by electrocoagulation was followed by uneventful recovery. Three months later the patient reported that he again had copious hematuria. As no cause could be found, he was discharged with instructions to return if the bleeding recurred. A month later he returned with very severe hematuria which necessitated a blood transfusion. Cystoscopic examination showed that the blood was coming from the right kidney. Pyelography revealed a tumor extending from the kidney into the pelvis. On the basis of the history, this was assumed to be an angioma. Examination of the kidney after its removal showed an angioma on the external surface of the organ near the right pole in addition to the angioma in the pelvis. The patient recovered and was still well six months after the operation.

Very few cases of angioma of the bladder or of the kidneys have been reported, and the author knows of no other case of angioma occurring in both the bladder and a kidney. He believes that so-called idiopathic hematuria is sometimes due to an angioma.

For small angioma of the bladder the best treatment is electrocoagulation, and for larger ones, surgical removal or excision or resection of the bladder. For angioma of the kidneys, the best treatment is nephrectomy as the organ may contain more tumors than is apparent. The diagnosis of angioma of the kidney is extremely difficult unless the tumor communicates with the pelvis and causes hematuria.

ANDREY GOSS MOROZ, M.D.

Jorns, G.: The Demonstration of Adrenal Lipase in Hyperphroid Tumors (*Nachweis von Nebennierenlipase bei Hyperphroiden Geschwulsten*). *Arch. f. kl. Chir.* 1933 LXXII, 781.

In disease of a given organ the presence of the fat-splitting ferment of that organ can be demonstrated in the serum by the stalagmometric method. Differentiation of the numerous organic lipases is possible because of their sensitivity or resistance to different toxins. A functional test for disease of the adrenals similar to that for diseases of the pancreas is based on the demonstration of a specific adrenal lipase in the blood. The fat-splitting ferment of the adrenals is very sensitive to atoxyl

and chloral hydrate but completely resistant to strychnine, quinine and cocaine. The demonstration in the serum of a lipase which is sensitive to chloral indicates the presence of an adrenal lipase foreign to the blood. The amount of serum used for a single test is 3 c. cm.

In a case of fibrocystic tuberculois of both adrenals which was proved at autopsy and in which there was complete destruction of the cortex and medulla with signs of Addison's disease during life the author was able to demonstrate definitely the presence of a blood foreign chloral-sensitive lipase in the serum. Later he conceived the idea of extending the test to cases of renal tumors since the majority of renal tumors in adults have their origin in displaced adrenal cells. He carried out the test in sixteen cases of malignant renal tumors, two of which were cases of recurrence. In nine the histological diagnosis of the tumor was confirmed. In fifty five control cases of various diseases, including other renal conditions, no chloral-sensitive lipase could be demonstrated in the serum. Tests for the presence of an adrenal lipase were made also on extracts from the operatively removed renal tumors. Of the nine cases cited, the histories of which are presented briefly, a chloral-sensitive fat-splitting ferment was found in five. The extracts from hypernephroid tumors also contained an adrenal lipase. The four cases in which the lipase could not be demonstrated in the serum were cases of sarcoma, malignant hypernephroma carcinoma, and hypernephroma recurrence respectively. The extract from the hypernephroma showed the lipase. Of seven cases of hypernephroid tumors the lipase test was positive in five and negative in two but the tests of the extracts were positive in all. In addition to the chloral sensitive lipase the extracts of tumors often contained a lipase which was resistant to atoxyl. Of the seven cases not operated upon in which a clinical diagnosis of malignant renal tumor was made but histological examination was impossible the adrenal lipase was demonstrated in five.

The test is of significance not only when it is positive but also when it is negative. In summarizing, the author says that in the majority of cases in which the presence of a hypernephroid tumor is demonstrated histologically or is assumed with considerable certainty the serum contains the specific adrenal lipase. This lipase is present also in the extracts of the operatively removed tumors but is absent from the serum in cases of renal sarcoma or carcinoma. It seems justifiable to conclude that the adrenal ferment is present in the serum only in cases of hypernephroid tumors and that it comes from the tumor itself. Accordingly a functional diagnosis of this type of tumor is possible. By such a test will it be possible to make an early diagnosis of tumors which become manifested clinically so late. However a positive demonstration is to be expected only in cases of the so-called Grawitz tumor

STRAUSSER (Z)

BLADDER, URETHRA, AND PENIS

Pierson L. E. and Nervig I. E.: The Formation of Bone in Cystotomy Scars. *J. Urol.* 1933 xxx 83

The authors report a case of bone formation in a cystotomy scar and cite fifteen cases previously reported. In their own case two dense bean-sized masses were found in the scar two months after a cystotomy for bladder drainage. Microscopic examination revealed fibrous connective tissue containing spicules of developing bone. Osteoblasts were found gradually invading the connective tissue and depositing bone which in turn enveloped the cells to form characteristic canaliculi.

The authors conclude that although many theories have been advanced with regard to the origin of this bone formation the process is not yet understood. FRANK M. COCHRAN, M.D.

Nicolini R. C.: Cancer of the Penis (Cancer del pene) *Semana med.* 1933 xl, 1590

While cancer of the penis is not common, it is far from being a rarity. If the diagnosis is made early radical operation may sometimes be avoided.

The condition is most common in the fifth decade of life, but occasionally it occurs in young men and sometimes even in boys. The literature records a case in which it occurred in a boy two years old. The author's youngest patient was twenty two years of age.

The local predisposing cause may be traumatic or inflammatory or the degeneration of a benign lesion. The condition may develop from warts from scars left by venereal sores and in association with urethral fistule or chronic balanitis. Phimosis is an important predisposing cause since the associated retention of smegma and urine favors the development of balanitis vegetations and fissures of the foreskin. It is claimed that the circumcised Jew is exempt from cancer of the penis. The possibility of inoculation from the uterine cervix has been suggested but if this occurs it is evidently extremely rare.

In most cases the condition begins as a wart on the glans or the inner surface of the prepuce. More rarely it appears first as an indolent ulcer, a subcutaneous nodule or pimple, or a patch of leukoplakia. Regardless of its origin, it gradually assumes a definitely cancerous appearance. As the ulcer advances it involves all tissues in its path. It has a thin foetid discharge and becomes deep and irregular. Its edges become hard and everted. At the same time the exuberant warty growth progresses. Predominance of the ulcer or warty growth determines whether clinically the lesion is warty or ulcerative. The inguinal glands enlarge and become involved by the pyogenic process as well as by the cancerous process so that they are matted together and may even suppurate and produce an epaetheomatous ulcer in the groin.

The lesions which may be confused with cancer of the penis are warts, chancre, tuberculous ulcers

and chronic ulcers from balanoposthitis. All growths or ulcers that prove intractable should be regarded with suspicion. Immediate biopsy should be performed on such lesions, and when the microscopic examination confirms the suspicion proper treatment should be instituted at once.

The treatment indicated in the majority of the cases is radical amputation with removal of all lymph nodes and followed by radium or deep X-ray therapy. The operative work should be done with the electrical cautery knife instead of the scalpel. In all but very early cases the lymphatics should be very widely removed as recurrences develop more frequently in the lymphatics than elsewhere. In certain cases, depending on the extent of the neoplasm and its histological structure, radium irradiation may be employed more advantageously than surgery. When the destruction is not far advanced, portions of the penis may be preserved. In early cases, diathermic coagulation has also been employed with successful results.

WILLIAM R. MECKEE, M.D.

GENITAL ORGANS

Abeshouse, B. S.: Infarct of the Prostate. *J. Urol.*, 1933, xiii, 97.

Abeshouse reports three cases of infarct of the prostate. At the time of operation all three were considered to be typical cases of benign adenoma of the prostate.

In a careful review of the literature of the past thirty years Abeshouse was unable to find any references to infarction of the prostate. He states that the mechanism of production of the condition is not known. As causes he suggests infection primary in the bladder, prostate, or prostatic urethra or secondary to instrumentation or preliminary catheter drainage, circulatory disturbances in the perineal or prostatic region secondary to a general vascular disease and the pressure of the catheter on the walls of the prostatic urethra.

The diagnosis may be easy when the infarct presents the characteristic zonal arrangements, but at times the differentiation of the condition from early carcinoma, abscess, and hemorrhagic extravasation may be difficult. FRANK M. COCHRAN, M.D.

Hammond T. E.: Cancer of the Prostate: Its Diagnosis and Treatment. *Bull. J. Urol.* 1933, v, 131.

Hammond states that in Britain many surgeons with special experience in urinary surgery are of the opinion that in cancer of the prostate no other operation than cystectomy is advisable. This theory is based on the following considerations:

1. The patient must live.
2. Life must be worth living.
3. The expectation of life must justify the inconvenience that follows the operation.

Radical enucleation and radium and X-ray irradiation are discussed. From his observations Ham-

mond concludes that these methods together with the punch operation are less beneficial than cystectomy.

Hammond divides carcinomata of the prostate into (1) the acute fulminating type, (2) the disseminating type, and (3) the scirrhous type. He cites two cases which show how slow the growth of the cancer may be. He believes that the term "precancerous" has no meaning. He discusses the operative treatment and the general postoperative care of cases of cancer of the prostate.

DONALD K. HESSE, M.D.

Young, H. H.: The Ultimate Results in the Treatment of Carcinoma of the Prostate by Radical Removal of the Prostate, Vesical Neck, and Seminal Vesicles. *J. Urol.*, 1933, xiii, 531.

Young discusses some of the gross characteristics of carcinoma of the prostate, describes his technique for radical prostatectomy and gives tables showing in particular the results obtained from one to seventeen years after the operation in forty-two cases.

Carcinoma of the prostate generally begins as a palpable nodule just beneath the posterior capsule, whereas hypertrophy of the prostate almost never begins in this region. The two conditions may be associated. Later carcinoma spreads in all directions.

Young reports a case in which he made a diagnosis of carcinoma of the prostate in 1905 and it appeared that a radical operation could be carried out without much difficulty. From pathological studies he had learned that in such an operation it is necessary to cut the prostate off from the membranous urethra and remove it with its capsule, a portion of the vesical neck, most of the trigone, and all of the seminal vesicles and ampullae. In the case cited the anastomosis between the wide-open bladder and the stump of the membranous urethra was not difficult, and an excellent result was obtained. Similar good results were obtained also in other cases treated in the same way. However after the operation the patients were incontinent when on their feet although not incontinent at night. As Young had preserved the external sphincter the incontinence was difficult to explain. In an anatomical study he observed that the pelvic fascia which reaches the prostate on either side splits to form the anterior layer of Denonvillier's fascia and the anterior prostatic fascia. He concluded that the vessels and nerves above the latter layer should be carefully guarded. Therefore, in his next case, he was careful to preserve the anterior prostatic fascia and to free the prostate from beneath it, thus avoiding injury of vessels and nerves.

The radical operation he now performs is begun with an inverted V incision and exposure of the prostate through the membranous urethra. The tractor is then introduced, the posterior surface of the prostate exposed and the urethra divided transversely. Next, the prostate is isolated from be-

neath the anterior transverse fascia the bladder exposed near the prostate, and the cuff of bladder resected with transverse division of the trigone 1 cm. below the urethral orifice. The bladder is then carefully pushed up and the ampullae and vesicles are isolated, clamped, divided, and ligated high up. The deep pedicle of the seminal vesicles is ligated and all serious bleeding stopped. The bladder is then easily anastomosed to the membranous urethra, a portion of the anterior bladder wall being used and the remainder being closed longitudinally. A retention urethral catheter is introduced for drainage and the angles of the wound are lightly packed with iodoform gauze.

Young believes that a radical operation should be done in all operable cases in which the diagnosis is certain, and that when any doubt as to the presence of malignancy arises at operation a portion of the suspicious nodule should be excised for frozen-section

examination before the prostatectomy is completed. Since the described change in his technique, most of his patients have had normal urinary control.

CLAUDE D. HOLMES, M.D.

Roche, A. E. Growths of the Testicle. *Proc. Roy Soc. Med., Lond.* 1933 xxvi, 1063

The author reports three cases of tumor of the testicle. From a review of the literature he concludes that incomplete descent of the testicle definitely predisposes to testicular neoplasma. He states that while trauma may initiate the formation of a tumor of the testicle this is difficult to prove. However trauma probably accelerates the growth of a tumor or leads to its discovery by palpation. Previous or associated inflammation is coincidental. In the treatment of testicular tumors orchidectomy plus irradiation is preferable to radical operation.

DONALD K. HINES, M.D.

and chronic ulcers from balanoposthitis. All growths or ulcers that prove intractable should be regarded with suspicion. Immediate biopsy should be performed on such lesions and when the microscopic examination confirms the suspicion proper treatment should be instituted at once.

The treatment indicated in the majority of the cases is radical amputation with removal of all lymph nodes and followed by radium or deep X-ray therapy. The operative work should be done with the electrical cauter knife instead of the scalpel. In all but very early cases the lymphatics should be very widely removed as recurrences develop more frequently in the lymphatics than elsewhere. In certain cases, depending on the extent of the neoplasm and its histological structure, radium irradiation may be employed more advantageously than surgery. When the destruction is not far advanced, portions of the penis may be preserved. In early cases, diathermic coagulation has also been employed with successful results.

WILLIAM R. MEYER, M.D.

GENITAL ORGANS

Abeshouse, B. S.: Infarct of the Prostate. *J. Urol.* 1935, xxi, 97

Abeshouse reports three cases of infarct of the prostate. At the time of operation all three were considered to be typical cases of benign adenoma of the prostate.

In a careful review of the literature of the past thirty years Abeshouse was unable to find any references to infarction of the prostate. He states that the mechanism of production of the condition is not known. As causes he suggests infection primary in the bladder prostate or prostatic urethra or secondary to instrumentation or preloinary catheter drainage circulatory disturbances in the perineal or prostatic region secondary to a general vascular disease and the pressure of the catheter on the walls of the prostatic urethra.

The diagnosis may be easy when the infarct presents the characteristic zonal arrangements, but at times the differentiation of the condition from early carcinoma, abscess, and hemorrhagic extravasation may be difficult. FRANK M. COCKEY, M.D.

Hammond, T. E.: Cancer of the Prostate: Its Diagnosis and Treatment. *Br. J. Urol.* 1933, v, 131

Hammond states that in Britain many surgeons with special experience in urinary surgery are of the opinion that in cancer of the prostate no other operation than cystostomy is advisable. This theory is based on the following considerations:

1. The patient must live.
2. Life must be worth living.
3. The expectation of life must justify the inconvenience that follows the operation.

Radical enucleation and radium and X-ray irradiation are discussed. From his observations Ham-

mond concludes that these methods together with the punch operation are less beneficial than cystostomy.

Hammond divides carcinoma of the prostate into (1) the acute fulminating type, (2) the disseminating type, and (3) the scirrhous type. He cites two cases which show how slow the growth of the cancer may be. He believes that the term "precancerous" has no meaning. He discusses the operative treatment and the general postoperative care of cases of cancer of the prostate.

DOUGLAS E. HENRI, M.D.

Young, H. H.: The Ultimate Results in the Treatment of Carcinoma of the Prostate by Radical Removal of the Prostate, Vesical Neck, and Seminal Vesicles. *J. Urol.* 1935, xxi, 531

Young discusses some of the gross characteristics of carcinoma of the prostate, describes his technique for radical prostatectomy and gives tables showing in particular the results obtained from one to seventeen years after the operation in forty-two cases.

Carcinoma of the prostate generally begins as a palpable nodule just beneath the posterior capsule, whereas hypertrophy of the prostate almost never begins in this region. The two conditions may be associated. Later carcinoma spreads in all directions.

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The radical operation he now performs is begun with an inverted "V" incision and exposure of the prostate through the membranous urethra. The tractor is then introduced, the posterior surface of the prostate exposed, and the urethra divided transversely. Next, the prostate is isolated from be-

toes but the condition does not progress to ankylosis or marked deformity.

Fibrositis is defined as an inflammation of the connective tissues of the body.

In the discussion of the etiology of arthritis, the Committee calls attention to the usual foci of infection and states that there may be a general infection of the pharyngeal and nasal mucous membranes in the absence of local infection in the tonsils and nasal sinuses. It reserves judgment regarding the reports of American observers who claim to have isolated streptococci in cultures of the blood of arthritics and recommends further work with regard to this problem. Attention is called to the fact that imbalance of endocrine glands, especially the thyroid, is frequent and of importance in arthritis.

The morbid anatomy in the main types of arthritis is discussed.

In the discussion of the biochemistry of arthritis the report states that the blood sedimentation test is of particular value in the differentiation of rheumatoid arthritis from the primary form of osteo-arthritis, which is usually monarticular. Rheumatoid arthritis is generally associated with a glucose intolerance which is probably due to a metabolic disturbance in the tissues rather than in the pancreas. Calcium, magnesium, and phosphorus studies and studies of the urine, sweat, and gastric juice in arthritis have been of little aid.

The Committee believes that radiology may be expected to increase in value in the differential diagnosis of chronic arthritis, but discusses it chiefly with regard to osteo-arthritis of the hip and spine.

The differential diagnosis of the various types of arthritis is discussed at length and summarized in three tables.

The discussion of the treatment deals with prophylaxis, vaccines, drugs, endocrine preparations, diet, physical methods, orthopedic and surgical measures, national schemes for treatment, and advertised remedies.

Prophylaxis is very complicated, especially if arthritis is due in part to a vicious cycle including chronic sepsis, metabolic disturbances and endocrine deficiency.

Vaccine therapy is of value in some cases even though the bacteriology of the disease is questionable. Either stock or antigenous vaccines may be used. The dosage is more important than the type. The injections should be sufficiently small to prevent a severe general reaction and sufficiently large to cause a definitely favorable response in the local condition. The treatment should be begun with a small tentative dose of from 20,000 to 50,000 streptococci if a septic focus is suspected and with a dose of from 20,000 to 500,000 if no septic focus is present. The injections may be given in increasing strength every five or six days and continued for a few weeks if improvement follows. Protein shock therapy has been generally disappointing.

Drugs have no specific value, but pain relievers such as the salicylates, phenacetin and amidopyrin

are valuable. Cinchophen and other quinoline derivatives sometimes help but must be used with caution because of their toxic effects on the liver. Salol, guaiacol carbonate and other intestinal antiseptics may be employed in chronic cases. Iodine compounds are widely used. Methyl salicylate and A.B.C. Liniment may be applied locally for the relief of pain. In lumbago, local injections of sterile glucose solution are beneficial, and in sciatica, the injection of sterile normal saline solution into the nerve sheath has been found of value.

Endocrine therapy is limited to disorders of the thyroid and ovaries. The influence of any other glands is highly problematical. Villous arthritis and osteo-arthritis are often associated with hypothyroidism whereas rheumatoid arthritis is often associated with hyperthyroidism. Monarticular osteo-arthritis is often found in women with uterine fibroids or menstrual irregularities and is frequently relieved by diathermy treatments to the cervix and pelvic organs, possibly as the result of an effect on the ovaries. The conclusion is drawn that endocrine disturbances may predispose to but do not cause, arthritis.

With regard to diet, there is little uniformity of opinion. Food idiosyncrasies should be inquired into but the patient usually knows what foods do and what do not, agree with him. Adequate supplies of Vitamins A, B and D are advisable, and constipation should be prevented or overcome by diet.

The physical treatment indicated includes the application of heat, massage, and exercises. Heat above 100 degrees F. is stimulating and beneficial. Massage is valuable except when it is applied to inflamed joints, where it is harmful, and when it is applied to ankylosed joints where it is useless. An inflamed joint should be splinted in the best position. Active motion should precede passive motion. Activation of the local symptoms indicates further rest. Diathermy is especially valuable in osteo-arthritis of the hip and for pelvic treatments. Ultraviolet rays increase the general resistance, but have no other beneficial effect in arthritis. They may be beneficial in acute fibrositis, but may make sciatica worse. The value of the roentgen rays is questionable. Mineral waters and baths probably owe their value to the stimulation of general metabolic and excretory functions rather than to any specific ingredients in the water. The type of climate most beneficial varies in different cases, but as a rule a cold or cool temperature with protection from wind and dampness is best.

The importance of orthopedic and surgical treatment is gaining wider recognition. Spondylitis should be treated early by recumbency with daily exercises for a month or more, and a spinal brace should be worn when the patient is allowed to get up. In active hip disease the first indications are the relief of weight bearing, rest and fixation. Later use of the limb short of irritation of the joint will help maintain function but deformities must

be guarded against by splints, exercises, and massage. Manipulation of a stiff knee joint under anesthesia should never be attempted unless the patella is freely movable. Even then, there is danger of fat embolism. It is well to allow six months to elapse between the subsidence of the infection and attempts at forcible joint manipulation. Forcible manipulation of stiff fingers should never be attempted as the results are invariably poor. The general principles outlined in this report for the treatment of the various joints and the optimum positions for ankylosis are essentially the same as those found in most orthopedic textbooks.

Holland, Germany and Sweden have more or less national schemes in operation for the treatment of arthritis. The Committee suggests a scheme for Great Britain. It is presented only in outline with out specific details as to how it might operate.

The Committee recognizes the need for legislation for effective control of the traffic in proprietary and advertised remedies for arthritis.

More attention to arthritis in medical schools and postgraduate special instruction for the general practitioner are recommended.

Among the subjects suggested for future research are the incidence of the disease in the country as a whole in various localities, and in relation to various trades and occupations, the nature and strain of bacteria responsible either by direct action or by their toxins and methods for the detection of the responsible organisms or toxins. The Committee realizes that such research requires specially equipped hospitals and trained observers. In the field of biochemistry the significance of the sedimentation test awaits elucidation. Also necessary are further investigations on calcium metabolism, liver function, allergy and the presence in the blood of hemolysins and glutathione. A classification satisfactory to clinicians, radiologists, and pathologists is highly desirable, and controlled experiments should be carried out to determine the relative merits of the many therapeutic methods advised for the treatment of the various forms of arthritis.

CHARLES C. GUY, M.D.

Keefer, C. S.: The Classification and Certain Pathological Aspects of Chronic Arthritis. *New England J. Med.*, 1933, CVIII, 1057

The author states that there is perhaps no branch of medicine in which there has been more confusion in terminology than in the branch dealing with diseases of the joints. However if the history of the terms is studied, it will be plain that the introduction of each term corresponded to some special conception.

The terms applied to arthritis will vary with the special interests of the physician discussing the condition. The terms that are suitable for the pathologist may not be satisfactory to the clinician or the investigator interested in the causes of the disease. The American Committee for the Control of Rheumatism has proposed a classification based

on the predominating pathological changes in the joints which were defined some years ago by Nichols and Richardson. The British Ministry of Health and the International League for the Control of Rheumatism have adopted similar classifications, but as the terms they use are different the confusion continues. For example, the term "atrophic arthritis" as adopted by the American Committee is used synonymously with the terms "rheumatoid arthritis," "primary progressive arthritis," and "proliferative arthritis," and the term "hypertrophic arthritis" is used in place of "degenerative arthritis," "osteo-arthritis," and "arthritis deformans." In the use of any classification it is necessary to define precisely what is meant by the terms employed.

From the standpoint of the clinician, the use of the classification adopted by the American Committee for the Control of Rheumatism has as its chief attraction simplicity. It seems to be further agreed that the 3 main divisions of arthritis proposed include only cases in which a specific cause cannot be proved. From the standpoint of anatomical diagnosis this classification is satisfactory but one must not overlook the fact that the diagnosis of atrophic or hypertrophic arthritis should never be accepted as the sole diagnosis until all of the known causes of arthritis have been excluded. Nichols and Richardson repeatedly emphasized that the 3 pathological types described by them (proliferative and degenerative) were probably caused by a variety of agents, and that the classification proposed by them was an anatomical classification.

It is not a simple matter to make a precise diagnosis in every case of arthritis even when the cause can be detected with certainty. Allison and Ghormley reported that of 41 cases in which the diagnosis of tuberculosis of the joints was made, only 27 (66 per cent) were proved to be due to tuberculosis, and of 42 cases in which tuberculosis was not considered, it was proved to be present in 55 per cent.

Because of these facts and the confusion of terms, Keefer stresses the importance of attempting to make an etiological as well as an anatomical diagnosis. He states that when he refers to the etiological factor he refers not to infectious agents alone, but also to other factors such as trauma, static and mechanical defects, errors in metabolism such as those associated with gout, and bleeding such as occurs in hemophilia.

It seems to Keefer that the study of arthritis has been hampered by a lack of exact knowledge regarding the anatomical variations occurring in the joint structures with advancing age. Such knowledge is of importance with regard to the ultimate changes that may occur as the result of damage from the invasion of a foreign substance, the early effects of injury to joints, and the prevention of certain conditions.

In an attempt to determine the changes that may be anticipated at various age periods, the author and his colleagues made a systematic study of 100 knees

joints of patients coming to autopsy. Whenever possible, the entire knee joint was removed together with the lower end of the femur and the upper end of the tibia. When this was not possible, the entire articular surface was removed by means of a saw. The gross appearance of the specimen was recorded and any areas appearing abnormal were studied histologically.

Sixty-seven of the joints were obtained from males and 33 from females. As the changes were precisely the same both qualitatively and quantitatively, the 2 groups are considered together.

It was found that alterations in the knee joint increase with advancing age. The areas most frequently involved are those in contact and therefore those subjected to the greatest weight, movement, and strain. The anatomical changes are identical with those commonly recognized as occurring in degenerative or hypertrophic arthritis. In some cases they were seen in an early stage and in others in an advanced stage of degeneration. There is justification for the belief that degenerative or hypertrophic arthritis is a process associated with aging of the joint tissues. A full explanation of the various factors responsible for this process is still awaited. However, the conception that aging of joint tissue contributes to the changes is essential for a complete understanding and evaluation of the clinical condition known as degenerative arthritis. As all of the lesions in a joint involved by degenerative (hypertrophic) arthritis may be exaggerated or increased by trauma, hemorrhage, infection, the deposit of urates, the formation of loose bodies, or static deformities, the final result will depend on the summation of a number of factors.

H. EARLE CORWELL, M.D.

Plemister D. B., and Hatcher C. H. Correlation of Pathological and Roentgenological Findings in the Diagnosis of Tuberculous Arthritis. *Am J Roentgenol.* 1933 xlix, 736

Tuberculous arthritis may be primary in either the bone or the synovia, but there are no very reliable statistics as to the relative frequency of each. In either case a diffuse tuberculous synovitis eventually develops and the granulations attempt to spread over the surfaces of the articular cartilage and destroy it. In some joints the articular cartilages fit accurately together while in others, particularly the knee they are of a different contour so that there are large areas of both free surfaces and surfaces in contact. In joints with articular cartilages extensively in contact the granulations are kept off the surfaces of the cartilage, but they destroy the cartilage to some extent by erosion at the margins. In joints with surfaces of cartilage both free and in contact the free cartilage is gradually overgrown and eroded by the granulations.

As the disease progresses in any type of joint the articular cartilage suffers from nutritional disturbances and the action of toxins, and subchondral granulations, usually of a non-specific type and free

from tubercles, are formed. The granulations gradually absorb the bony articular cortex and deeper portions of cartilage and may eventually detach the cartilage completely. Because of the absence of proteolytic fermenta in tuberculous exudate, the loosened cartilage may persist for a long time. At this stage the roentgenogram of a joint with articular cartilages extensively in contact shows regional bone atrophy, reduction or loss of density of the shadow of the bony articular cortex and preservation of the normal width of the cartilage space of the joint. In joints with extensive areas of cartilage not in contact, such as the knee, the overgrowing surface granulations may destroy the entire thickness of cartilage and the underlying bony cortex in a part or all of such areas before there is extensive development of subchondral granulations. The roentgenograms of such joints show regional bone atrophy, diminution or disappearance of the shadow of the bony articular cortex in the regions not in contact, and preservation of the shadow of the bony articular cortex and of the cartilage space in the regions of the condyles and the tuberosities in contact. Eventually the entire articular cartilage may be destroyed. When this occurs, the roentgenogram shows narrowing or complete disappearance of the cartilage space of the joint.

In the advanced stages there may be secondary invasion of the bone at the traumatized points of contact and weight bearing with resulting large areas of necrosis. The invasion is usually bilateral at opposite points in the bones. After a long time such areas may become detached with the formation of "kissing sequestra." The roentgen characteristics of areas of secondarily invaded and necrotic bone are a more or less conical or hemispherical shadow of bone bordering on the weight bearing portion of the joint with an incomplete line of demarcation about it and usually casting a denser shadow than the surrounding living bone. As a rule the shadow of the bony articular cortex of normal or reduced density is preserved on it and the condition is bilateral, giving the picture of kissing sequestra. In some instances there is complete destruction of the dead bone leaving pits or grooves along the joint surfaces.

A small primary focus in the bone bordering on the joint may break down, leaving a pit or cavity but a large focus becomes separated as a sequestrum and retains its original density.

Tuberculous arthritis in young children varies somewhat in its pathological characteristics from tuberculous arthritis in adults. In the larger joints with relatively thick articular cartilages, particularly the knee, destruction by surface granulations of the portions not in contact is less complete than in adults. Subchondral granulations frequently do not detach articular cartilage. In the smaller joints with thinner cartilages and in older children the course of the condition is more nearly like that in adults. Partitioning of the knee joint by healing processes occurs oftener, and different degrees of involvement within the partitions are more pro-

nounced in children. Primary bone lesions that can be identified definitely by roentgen-ray examination or at operation are more frequently located in the metaphysis than in the epiphysis. Secondary bone invasion is usually bilateral in the joint and most marked at the points of weight bearing as in adults, but usually results in destruction rather than sequestration of the necrotic bone, regardless of the extent of the involved area.

Nine cases representing different types of involvement are reported at some length with especial regard to the roentgen ray findings and the pathological changes determined after operation. The case reports are supplemented by roentgenograms and photographs.

ADOLPH HARTUNG, M.D.

McMaster P. E.: Tendon and Muscle Ruptures. Clinical and Experimental Studies on the Causes and Location of Subcutaneous Ruptures. *J. Bone & Joint Surg.* 1933, xv 703

Spontaneous rupture of a tendon may follow direct or indirect trauma. It occurs most frequently after indirect trauma such as that occurring when a forcefully contracted tendon is subjected to strong passive force in the opposite direction. Even under such conditions the tendon will rupture only if it has been weakened by previous injury, disease, or obstruction of its blood supply.

"Baseball finger" is usually a separation of the extensor tendon from its insertion, often with the detachment of a small fragment of bone. The treatment of this condition is hyperextension unless the patient is not seen until more than four weeks have elapsed since the injury. Under the latter circumstances open operation is preferable to longer conservative treatment.

Direct violence over the first interphalangeal joint may cause a "buttonhole" rupture of the central dorsal slip of the extensor of the finger with displacement of the lateral slips. Open operation is necessary for a good result.

Rupture of the supraspinatus and Achilles tendons and of the long head of the biceps brachii occurs only when there has been previous weakening by disease.

Partial or complete muscle rupture is frequent. It occurs in either normal or diseased muscles as the result of direct or indirect violence. In many cases in which a diagnosis of sprain, myositis, or neuralgia is made the condition is probably a small muscle rupture. The author reports experiments which were carried out on the gastrocnemius muscle of rabbits. The muscle was left attached to the femur and os calcis and increasing weights were applied to the stretched muscle and tendon, both gradually and suddenly. This was done also after recent injury of the tendon and several weeks after the healing of an artificial tendon injury. It was found that when the tendon was normal it did not rupture, but its insertion to bone or muscle gave way. When the tendon or muscle was pulled from its origin or insertion a small fragment of bone was detached. Following

severance of about three-fourths of the tendon, rupture did not occur with ordinary activity. Under severe strain, rupture occurred immediately only when about one-half of the tendon was cut and failed to occur if the test was delayed for four or five weeks, until after the injury had healed. Healing is retarded by interference with the blood supply. In the rabbit the essential blood supply is carried in the tendon substance rather than mainly in the sheath. Therefore obstruction of the blood supply by ligation of the tendon retards healing and favors later rupture. Stripping away of the sheath tissues is also a factor in tendon rupture.

CHESTER C. GUY, M.D.

Daniel, R. A., Jr., Upchurch, S. E., and Blacklock, A.: The Absorption from Traumatized Muscles. *Surg. Gynec. & Obst.* 1933, lvi, 1017

As, according to the theory attributing shock to toxemia, the absorption of toxic products from the injured area is responsible for the diminution of the blood volume and blood pressure in that condition, the authors carried out studies on dogs to determine the relative absorptive powers of traumatized and normal tissues. Phenolsulphonophthalein and strychnine were injected. The studies with each included three groups of experiments: (1) those in which the injection was made into the muscle of the anterior abdominal wall of normal dogs, (2) those in which it was made into the anterior wall of dogs which had had one extremity traumatized, and (3) those in which it was made into the injured muscle of a traumatized extremity.

In the experiments with phenolsulphonophthalein made on normal dogs most of the dye had been absorbed and excreted at the end of four hours following the injection. The average amount recovered in the urine was 94.5 per cent. When the dye was injected into the abdominal wall of dogs with one extremity traumatized, the amount in the urine varied from 80 to 97 per cent and averaged 87.5 per cent. The elimination of the dye was slower than in the cases of normal dogs, and a greater amount was recovered in the second hour than in the first. In the experiments in which the dye was injected into the center of the traumatized area the average amount recovered from the urine was 53.8 per cent and the rate of elimination was considerably slower. From these findings it is evident that the absorption of the dye from injured muscle is markedly diminished as compared with the absorption from normal muscle.

In the experiments on five normal dogs in which strychnine (10 mgm. per kilogram of body weight) was injected into the abdominal wall severe convulsions began from seven to twenty-one minutes after the injection and three of the animals died. When the injection was made into the abdominal wall of five dogs with injury of one extremity convulsions began from six to twenty minutes after the injection and in four of the dogs were quite severe. All of the dogs died. In the experiments in which the injection

was made into the traumatized muscle, convulsions began from one hour and ten minutes to three hours later. In none of the animals were the convulsions severe. The dogs with convulsions died from two hours and five minutes to sixteen hours after the injection. Death was almost certainly due to the trauma and not to the strychnine. These findings show that the absorption of strychnine from the anterior abdominal wall is altered very little by trauma to an extremity and that strychnine is absorbed very slowly when it is introduced into a traumatized area.

RUDOLPH S. REZEC, M.D.

Keyes, E. L. Observations on Rupture of the Supraspinatus Tendon. *Ann Surg* 1933 xcvi 849

Rupture of the supraspinatus tendon is related to subdeltoid or subacromial bursitis. It is a common lesion and often occurs before the fiftieth year of age.

To determine its incidence, Keyes examined the supraspinatus tendons of seventy-five cadavers. He found a rupture in 14 (19.38 per cent) of 73 cadavers, 19 (13.38 per cent) of 142 shoulders examined, 5 (17.24 per cent) of 29 white cadavers, 9 (20.45 per cent) of 44 negro cadavers, 11 (18.97 per cent) of 58 male cadavers and 3 (20 per cent) of 15 female cadavers.

The average age of the total number of cadavers was fifty-four and three-tenths years whereas the average age of those with a ruptured tendon was thirty-five and a half years. The youngest cadaver with a torn tendon was fifty-one years old, and the oldest was eighty-six years. No torn tendon was found in the 38 cadavers under fifty years of age.

Both tendons were torn in 5 cadavers and only 1 was torn in 9. Of the unilateral tears, 5 were on the left side.

In a typical lesion the ruptured tendon may be found to split 0.7 cm. lateral to the acromion and to proceed on either side of the tear to its insertion on the greater tubercle of the humerus. The underlying joint capsule is pierced so that the joint cavity is exposed. The rupture is usually triangular and is never complete. The torn edges of the tendon are smooth, but there is some fraying of other portions of the tendon and of the long head of the biceps. The greater tubercle is knobby and rough in its exposed portions.

Akerson reported the incidence of rupture of the supraspinatus tendon as 48 per cent on the basis of the number of cadavers examined and 39 per cent on the basis of the number of shoulders examined. The corresponding figures given by Codman were 5 and 5 per cent. Akerson's high percentages are ascribed to the fact that the studies were made on the cadavers of aged persons with chronic disease.

Keyes believes that the lesion is due to a traumatic, infectious, degenerative, or metabolic process which progresses with years gradually causing degeneration of the floor of the subacromial bursa and wearing through the tendon at its insertion into the greater tubercle.

RUDOLPH S. REZEC, M.D.

Foucault: Condensing Osteitis of the Semilunar Bone (Lunette condensante—ostéite condensante du semilunaire). *Bull et mém Soc nat de chir* 1933 lxx 360.

While climbing a ladder carrying a weight on his right shoulder a boy fifteen years of age slipped and the weight dropped, forcing his right hand into a position of forced hyperextension. He felt intense pain in the wrist but continued to work for a few days. At the end of three weeks the wrist was swollen and could not be used. Physical examination showed flattening of the thenar eminence and slight atrophy of the muscles of the forearm. There was limitation of flexion to 20 degrees of extension to 5 degrees, and of adduction and abduction to 5 degrees. Roentgen examination disclosed flattening and increased density of the semilunar bone. The bone was decreased to half its normal height and elongated from behind forward. Following resection of the semilunar bone by the dorsal route, functional recovery was rapid. At the end of two months there was an increase in flexion to 80 degrees of extension to 45 degrees and of abduction and adduction to 30 degrees, and pronation and supination were normal. The muscle atrophy was improving and the patient was able to go back to work without any incapacity.

This is a case of Kienboeck's traumatic malacia, a condition characterized by a history of trauma followed by an interval of freedom from symptoms before the development of disability.

Mutel and Gérard have classified malacia of the wrist into three types. In the first type fracture is primary. In the second type, the malacia is primary and pathological fractures take place in the diseased bone. In the third type the malacia seems to be due to a latent osteomyelitis and the picture is that of eburnated bone.

The prognosis varies. In some cases recovery results under treatment by immobilization and the use of hot air and diathermy. In others, operation is required. Rostock reported twenty-one cases in which he extirpated the semilunar bone and thirty-seven in which he employed conservative treatment. In the surgically treated cases the disability was only 7 per cent whereas in the conservatively treated cases it was 20 per cent. Operation does not restore function completely or immediately but relieves the pain at once.

In the discussion of this report GUIMBELLO described a similar case in which he operated. Histological examination showed only an ordinary inflammation. The patient left the hospital free from pain, but with a very stiff wrist joint.

AUDREY GOSS MORRAN, M.D.

Craig, W. McK. and Ghormley, R. K.: The Significance and Treatment of Sciatic Pain. Ambulatory and Institutional Methods. *J Am Med Ass* 1933 c, 1143.

Sciatica or sciatic pain may be a symptom of constitutional or systemic disease, a tumor or inflamma-

tion of the spinal cord or sciatic nerve, derangement or an inflammatory reaction about the lumbar vertebral intervertebral foramina, or sacro-iliac joint or postural strain.

In the treatment the contributory factors must be considered and eliminated if possible.

There is a large group of cases in which the sciatic pain is of uncertain pathogenesis, and efforts have been made to distinguish between sciatic neuritis and sciatic neuralgia. This may be possible clinically but the authors were unable to find specific treatment separately applicable to the two conditions.

The authors divide the methods of treatment of sciatica into the ambulatory and the institutional. Although the institutional form of treatment is the more efficacious, a certain percentage of the patients can be treated successfully by ambulatory methods. Institutional treatment can be used alone or to supplement ambulatory treatment.

The ambulatory forms of treatment and their results at the Mayo Clinic were as follows:

Epidural injection was done in eighty cases. In 53 per cent relief was complete, in 24 per cent it was moderate, and in 22 per cent there was no relief. Diathermy employed in thirty-six cases, was followed by complete relief in 33 per cent, moderate relief in 12 per cent, and no relief in 55 per cent. Epidural injection and diathermy were combined in twenty-one cases. In 43 per cent there was complete relief, in 10 per cent, moderate relief, and in 48 per cent, no relief. A sacro iliac belt and diathermy were employed in fifty-two cases. Relief was complete in 32.6 per cent and moderate in 13 per cent. In 54.4 per cent there was no relief. Epidural injection, a belt, and diathermy were employed in eight cases. Eighty-five per cent of the patients were completely relieved, 2 per cent were moderately relieved, and 13 per cent were not relieved.

Of twenty-eight patients who were confined to bed and treated by double Bucks extension, diathermy, epidural injection, intravenous injections of a foreign protein, and the removal of food of infection, 85.7 per cent were completely relieved and 14.3 per cent were moderately relieved. Of fourteen patients given similar treatment without epidural injection, 63 per cent were completely relieved, 23 per cent were moderately relieved, and 14 per cent received no relief.

Bray E. A.: Subchondral Granulation Tissue in Tuberculosis of the Knee Joint. *J Bone & Joint Surg* 1933 xv 631

At the Mayo Clinic a study was made of 102 tuberculous knee joints obtained by resection or amputation. In 91 microscopic sections were made through various portions of the articular surface. The tissue having been decalcified with nitric acid and embedded in celloidin, sections were cut and stained with methylene blue and eosin.

Subchondral granulation tissue evidently takes an active part in the progress of tuberculosis of the knee joint. Whether or not it can be shown to contain

definite tubercles, it is responsible for many of the pathological changes in cartilage and bone. Marginal erosion of the bone in cases which appear grossly to have only involvement of the synovial membrane is one of its most important accompaniments. Destruction of cortical bone with little if any diminution of the joint space is the result of the invasion of subchondral granulation tissue.

Destruction of cartilage at the center of the joint is due largely to the presence of subchondral granulations. In tuberculosis of the knee joint, cartilage is destroyed by (1) the marginal pannus, (2) tuberculous toxins, (3) the pressure of opposed articular surfaces, and (4) subchondral granulation tissue.

When subchondral granulation tissue is present beneath the center of the joint the picture is somewhat altered. The central cartilage is attacked from below. Its nutrition is impaired, and it becomes less resistant to the effect of opposing pressure. Tuberculous infection incites a response of granulation tissue beneath the cartilage and this is one of the most important factors determining the site of greatest cartilaginous destruction. Why in some cases there should be more central advance of this tissue with resultant destruction in pressure areas is not known. Weight bearing seems to be of only minor importance. Of the author's specimens with greater central destruction about half were derived from patients with a history of having walked on the leg most of the time prior to the operation. The histories of the others indicated that at one time there had been treatment intended to place the joint at rest.

The duration of the disease likewise appears to bear little relationship to the growth of subchondral granulation tissue.

The question has been raised as to whether traction is indicated in the non-operative treatment of tuberculosis of the knee joint. It has been shown that the superficial erosion of cartilage at the center of the joint by the formation of pannus is prevented or at least delayed until the late stage of the disease by the pressure of the opposed surfaces. On the basis of this observation alone traction would appear to be contra-indicated. However if there is a central growth of subchondral granulation tissue in the joints and traction has not been applied, erosion of the central cartilage from the effect of the opposing pressure will result in most cases. Obviously no definite rule can be established for the treatment of all cases.

The severity of the tuberculous infection and the amount of individual resistance may be factors determining the amount of subchondral granulation tissue formed and consequently the site of greatest cartilaginous destruction. In the cases reviewed there was no clinical evidence that such factors were causes of the changes mentioned.

Subchondral granulation tissue seems to be of importance in the formation of bony sequestra at the articular surfaces. In 47.7 per cent of the cases

reviewed subchondral granulation tissue arising from the margins of the joints was found between the cartilage and bone. Of the specimens in which subchondral granulations were present, there was definite evidence of tuberculosis beneath the margin and center of the cartilage in 29 per cent. In several others tuberculosis was strongly suggested but a definite diagnosis could not be made.

Subchondral granulation is probably a tissue reaction to an infectious process rather than to foreign material in the form of degenerated cartilage. Whether or not it presents the cellular characteristics of tuberculosis, it must be considered potentially tuberculous. In tuberculosis of the knee joint subchondral granulation tissue plays an active part in the erosion of bone, the demarcation of sequestra, and the destruction of cartilage.

Dieterich P. Cystic Meniscitis (La méniscite kystique) *Arch franco-belges de chir* 1931-32 xxxix, 617

Dieterich states that a condition described as 'meniscitis' has often been reported in the literature, but many of the cases were examples of a mild form of the condition, which he calls 'meniscism', and did not require operation. As most of them were treated by physical therapy, there was no histological evidence of true inflammation. True cystic meniscitis is rare. Dieterich has found the reports of only sixty-eight surgically treated cases. He himself has treated eleven cases surgically and five cases conservatively. Seven of his patients were women and nine were men. The youngest was fifteen years of age and the oldest sixty two.

In the cases of old persons, cystic meniscitis is probably often diagnosed as rheumatism. The chief cause in women is a defective static condition and the chief cause in men is external trauma. In all of the author's cases the external meniscus was involved. The cysts therefore occur in tissue that is not very dense and is well vascularized. Without doubt there is a vascular factor in its causation. It generally begins at the vessel hilus at the attachment of the anterior or posterior horn to the tibia. There is a degeneration or myxoid change of the connective tissue.

The chief symptom is pain which causes limping. In all cases of painful knee an examination for cystic meniscitis should be made by inspection and palpation. If a cyst is present it can be palpated above the head of the fibula. The cysts vary in size from that of the tip of the little finger to that of a pigeon's egg. The larger ones can be seen. When the knee is flexed the cyst glides into the joint if it is not too large and can no longer be felt. Generally there are no roentgen signs, but in each of the author's cases there was a small exostosis on the external border of the plateau of the tibia.

It is evident that in such cases physical therapy will do harm instead of good. The only treatment is resection of the meniscus. In the operation recommended by Dieterich a skin incision is made

beside the patella, running obliquely from above downward and from behind forward. A crucial incision is made in the tendons, but the capsule is incised horizontally as for the internal meniscus a little above the meniscus. A Bockel splint is then put on for ten days. The patient is allowed up on the twelfth day and mobilization is begun on the twentieth day. AUDREY GOSWAMI M.D.

Mitchner P. H. Ellis, V. H. Butler R. W. Slesinger E. G. and Others; A Discussion on Acute Suppurative Arthritis of the Knee Joint. *Proc Roy Soc Med Lond* 1933 xxi, 1379

MITCHNER reported seventeen cases of suppurative arthritis of the knee none of which was due to a penetrating wound of the joint. In six, the condition was caused by the extension of infection from a nearby staphylococcal osteomyelitis. As treatment, Mitchner recommended drainage by a long incision made laterally in front of the biceps tendon, followed by extension for three months, and then by weight bearing in a plaster cast for three months. He does not encourage early motion unless the patient is willing. He stated that 60 per cent function is a fortunate outcome. Pyemia of joints occurs in from 6 to 10 per cent of cases of scarlet fever. Early incision is advisable if the condition of the joint does not improve after one or two aspirations. Of the seventeen cases reviewed, amputation was done in three and death occurred in two.

ELLIS called attention to the great bactericidal powers of the serous membranes and the fact that while surgeons have learned to trust this power in the abdominal cavity they are still doubtful of it in cavities lined with synovial membrane. The synovial fluid nourishes the articular cartilage. Therefore if it is lost by frequent washing-out of the joint the articular cartilage will tend to be destroyed and ankylosis will result. If penetrating wounds of the knee are immediately excised and closed suppurative arthritis will not develop unless there is gross soiling of the joint. Drainage is established best by two long incisions on either side of the patella with counter-extension downward if necessary.

BUTLER reported that of twenty perforating wounds of the knee only three were followed by suppuration of the joint. In about 50 per cent of cases of gonorrheal arthritis suppuration results from superimposed pyogenic infection. Synovial fluid is bactericidal when fresh and an excellent culture medium when old. Therefore early and repeated aspiration is advisable and a free incision should be made if frank pus is present. Ankylosis resulted in about a third of Butler's cases. In another third, good motion was obtained. In the rest the results ranged from fair to poor.

GIRDLESTONE also advised repeated aspiration without washing out of the joint, followed by extension.

SLESINGER stated that it is important to get the patient to move the joint freely. He has found that

this can be done if there is sufficient extension of the leg to separate the joint surfaces completely.

CLARKE states that half of his patients had had a recent mild local injury and a fourth of them had a focus of infection. In the early stages some painless motion of the knee is possible and may delay the diagnosis unless puncture and examination of the joint fluid are done. Whether repeated aspiration or incision is advisable depends on the local and general progress of the condition under the former treatment. When anterior drainage alone is not successful, posterior drainage of the popliteal space is sometimes necessary. In Clarke's cases fixed traction on a Thomas splint with dressings every two or three days and encouragement of active motion as the joint improves is continued for about two weeks. Then, a non-padded plaster cast is applied for three or four weeks and the patient is allowed to walk freely during this time. Six out of seven patients treated in this way recovered full motion. Immediate active mobilization is probably not sound in principle. Moreover it is difficult to carry out and its results are less satisfactory than those of temporary immobilization. Clarke reported twenty cases. Full motion resulted in ten, partial motion in four, ankylosis in four and death in two.

FAIRBANK stated that if the joint is markedly oedematous it should be opened thoroughly. He drains by two anterior and two posterior incisions.

CHARLES C. GUY, M.D.

SURGERY OF THE BONES, JOINTS MUSCLES, TENDONS, ETC.

Wilson P. D., and Osgood R. B.: *Reconstructive Surgery in Chronic Arthritis*. *New England J Med* 1933, cxix, 117.

In the early stages of chronic arthritis the treatment should be medical and orthopedic. If such treatment were given in all cases, the number of arthritic cripples would be decreased.

At the present time there are many arthritides who are completely incapacitated by arthritic joint deformities which could be improved by reconstructive surgery. However, surgery should not be considered unless the disease is quiescent, the patient is in good physical condition and is able to co-operate and afford prolonged treatment, the end-result sought will be worth the effort, proper nursing care can be given, an adequate follow-up will be possible, and physical therapy equipment is available. Multiple operations in stages and a well-planned campaign of reconstruction are often required.

In the atrophic type of arthritis the problems are more difficult than in the hypertrophic type and surgery should not be undertaken until at least six months after all activity in the joint has ceased. In the hypertrophic type, activity is usually checked by rest so that the operation may be done at almost any time at which it offers hope of improvement. Gentle manipulation may be tried first. If success-

ful, it may render operation unnecessary. In cases of chronic arthritis of the knee with persistent chronic hydrops which resists all other forms of treatment, synovectomy is indicated. In other joints and in other types of the disease the results of synovectomy are usually disappointing.

In long-standing cases of flexion contractures of the knee the authors have been performing what they call "posterior capsulectomy." This consists in cutting the capsule posteriorly and separating the muscular and tendinous attachments to the posterior surface of the lower end of the femur. The leg is then placed in a cast in extension or if full extension is not immediately possible, bone traction through Kirschner wires in the tibia and on calcus is employed until the leg is straight. Mobilization is begun after two weeks and walking in caliper braces is allowed after four weeks. This operation has been satisfactory in over fifty cases, but should be limited to cases in which the roentgenogram shows no severe damage to the articular surfaces. When the articular surfaces have been severely injured, osteotomy is a better procedure. Osteotomy may be done for severe flexion contractures of the knee, hip, or wrist. In the form of hypertrophic arthritis known as "morbus coxae scillia," remodeling operations on the hip are often indicated.

In atrophic arthritis, arthrodesis is indicated only for the midtarsal and subtarsal joints. It is not necessary for the spine as the spine can be supported by braces until it becomes ankylosed by the disease. In hypertrophic arthritis of the hip arthrodesis is occasionally advisable, but ankylosis is difficult to produce.

Arthroplasty yields its best results in the jaw, elbow, knee, and hip. According to the older teaching it should not be done in atrophic arthritis, but in recent years the authors have been performing it with increasing frequency in this condition with surprisingly good results. It finds its widest range of usefulness in ankylosis of the elbow. It gives good results also in ankylosis of the knee, but in this condition longer after treatment is necessary. In ankylosis of the hip its results are less satisfactory. The authors therefore recommend it only when the ankylosis is bilateral. CHARLES C. GUY, M.D.

FRACTURES AND DISLOCATIONS

Inberg, K. R.: *Investigations Regarding the Effect of Immobilization for Different Periods of Time on the Rapidity of Consolidation of Fractures of Bones and the Restoration of Joint Function* (Versuche über den Einfluss verschiedener langer Immobilisationszeiten auf die Konsolidationsgeschwindigkeit und die Wiederherstellung der Gelenkfunktion). *Acta chirurg Scand* 1933, lxx, 363.

The purpose of this article is to discuss the question as to which of the two therapeutic methods—mobilization and immobilization—has the better effect on the union of fractures. To solve this

problem the author carried out fourteen experiments on dogs in which he kept ulnar fractures immobilized for various periods of time or left them entirely free and determined the time required for the occurrence of consolidation by roentgen ray examination.

It was found that when the immobilization was not continued sufficiently long at least twice as much time was required for consolidation as when immobilization was continued for an adequate period. After the elapse of half of the consolidation time revealed by roentgen-ray examination, discontinuance of immobilization had no further unfavorable effect. Determinations of the mobility of the joints showed that, because of the resulting retardation of consolidation, too brief immobilization is more unfavorable than more prolonged immobilization which results in stiffness of relatively brief duration.

The author concludes that in the treatment of fractures of the long bones immobilization is of great importance, and that until the optimum time of immobilization is known more exactly a fracture should be kept immobilized for half the consolidation time shown by roentgen ray examination.

Nové-Josseland and Pouzet: A New Method of Restoring the Roof of the Acetabulum in Dislocation of the Hip (Nouveau procédé de restauration du toit du cotyle dans la luxation de la hanche) *Rev d'orthop.*, 1933, 21, 240

Numerous operations have been devised to restore the upper border of the acetabulum in congenital dislocation of the hip. The essential feature of all of them is the creation of a bony projection to prevent upward and backward displacement of the head of the femur. The authors' operation is based on a somewhat different principle.

When the femur has been replaced the elongated capsule becomes plicated and thickened and, in the course of three or four months, sufficiently solid to give a certain amount of fixation to the femur. More important are the changes in the fibro-cartilage which is responsible for much of the depth of the acetabulum. In dislocation, the cartilage is displaced upward on the ilium and is flattened. Following reduction the cartilage assumes its triangular form, and after seven or eight months

will permit weight bearing. Ultimately there is a development of the bony acetabulum. This requires several years and is often incomplete.

To aid these processes by surgical means the authors reduce the femur and mobilize the cartilage sufficiently to displace it downward into its normal position where they fix it by means of osteoperiosteal grafts introduced between the cartilage and the bone. In addition to holding the cartilage in place the grafts form an accessory center of ossification.

The joint is approached by a Smith-Petersen incision and the cartilage is mobilized with a sharp periosteal elevator. During the operation the thigh is held in abduction and subsequently it is maintained in this position by a cast. In the cases of children seven or eight years old the cast may be removed at the end of a month and walking may be permitted two weeks later. In the cases of younger children the immobilization should be continued for two months.

Twelve cases in which operation was performed from twenty months to four and a half years previously are reported with roentgenograms. Three of the patients were eleven, twelve and thirteen years of age and nine were under ten years old.

In the cases of the three patients eleven, twelve and thirteen years of age an attempt was made to restore the articulation anatomically. On removal of the cast the limb was found to be blocked in abduction. In two cases subtrochanteric osteotomy was necessary and in one the limb was forcibly straightened at the price of a crushed epiphysis. The final results were good.

Because of the muscular shortening which occurs in cases of long-standing dislocation, the authors believe that the operation described is not suitable for patients over ten years of age. In their cases of children under ten years of age the purpose of operation was merely to stabilize the head of the femur in the new acetabulum. The functional results were entirely satisfactory.

The authors consider the operation described best suited to patients between six and ten years old. Before the age of six years sufficient space cannot be obtained to lodge the grafts and after the age of ten years there is danger of producing a stiff joint. For patients older than ten years the Lane operation is preferable.

ALBERT F. DE GROOT, M.D.

clinic universal donors are frequently employed without complications. According to Luetreler's serological investigations it is certain that the serum of a donor belonging to Group O has the ability to agglutinate red blood cells, but dilution and temperature are very important factors in this process. Dilutions of from 1:5 to 1:50 (with serum, not with Ringer's solution or salt solution as the latter contain chemical agents which neutralize the group-specific properties of Erythrocytes A and practically always those of Erythrocytes B) do not cause agglutination at temperatures of from 30 to 37 degrees. Accordingly the blood of universal donors is harmless with normal dilution and at body temperature, but dangers arise when dilution cannot take place, as, for example, in exsanguinated recipients, and when the blood is considerably cooled. Most blood-transfusion apparatuses cool the blood off considerably even to as low as 30 degrees. The author therefore recommends the Buerkle de la Camp apparatus which produces no noteworthy cooling of the blood, and has been used with good results in hundreds of cases. FRANCE (2)

Rajgorodskij I: Serious Complications After Blood Transfusion and Their Causes (Schwere Komplikationen nach Bluttransfusionen und ihre Ursachen) *Von der Arch* 92a, xxvii, 22

The author attempted to determine the degree of danger associated with blood transfusions. The question cannot be answered by statistics because a compilation of all cases of blood transfusion with all their complications is impossible. In large series of statistics dealing with blood transfusion, little attention is paid to the complications, and in the description of accidents, the total material is not reviewed. However accurate analysis of the major complications yields certain valuable conclusions. In the literature the author was able to find 143 cases of complications due to transfusion, 85 of which were fatal. The author divides such complications according to their development into the following groups:

1. The use of the donor without preliminary serological tests. In this class must be included all of the cases of blood transfusion with an unfavorable outcome which occurred before iso-agglutination was recognized. However, even today some physicians perform blood transfusions without serological control. Of 25 cases in which this was done, 13 were fatal.

2. Deteriorated standard sera. The standard sera for the determination of the grouping of the patient and donor are very resistant, yet they may deteriorate and lose their agglutination power. If sera with a weak titer are used a positive agglutination test may become doubtful or even negative. The donor is best selected by the following 3 procedures: (a) determination of the blood group to which he belongs by means of previously standardized sera. (b) a direct cross-agglutination test and (c) the biological test of Oehlecker. Of 3 cases in the

literature in which deteriorated standard serum was used, 1 had a fatal termination.

3. Incorrect technique of blood-group determination. In spite of its technical simplicity this determination requires a certain amount of knowledge, skill, and care on the part of the physician. Pseudo-agglutination and rouleaux formation of the erythrocytes may cause diagnostic errors. In order to avoid them many clinics and dispensaries have the blood-group determination made independently by 3 assistants, and in some cases it is checked by repetition. In tables the author lists 13 fatal cases, and in the text he mentions 22 severe complications with 10 fatalities.

4. Incorrect labeling. In this group are included the accidents arising from typographical errors, incorrect data of the physicians and their assistants, and mistakes due to the use of varying nomenclatures of blood groups (Moses, Janaky, Dangers-Hirschfeld). Four cases with hemolysis, but with a favorable outcome have been found in the literature.

5. Instability of the blood groups, that is, changing from one group to another has not yet been established. All cases claimed to be of this nature were disproved on careful investigation, and in most of them a new cause of error was discovered. However it must be recognized that the agglutination power of the erythrocytes of the same person can undergo considerable change, and that the group relationship of donor and recipient must be established with one and the same serum. In order to avoid complications of this nature it is advisable never to rely entirely on a previously determined group relationship, but to undertake a direct cross-grouping before each transfusion. One case of this sort with a fatal termination has been reported in the literature.

6. Subgroups. The existence of accessory or intermediate blood groups in respect to agglutination has not been proved. The cases which have been described can be explained easily by cold agglutination. Unfortunately this atypical agglutination, whatever its explanation, has led to very serious results. Therefore it must be avoided by direct cross-agglutination just before the transfusion. Three cases of this character with a fatal termination, have been reported to date.

7. Universal donors. The literature reports 11 cases of serious complications, occurring after transfusion from universal donors to patients belonging to Group II A, especially those with severe anemia. In 6 cases death resulted. In order to prevent complications from this cause it is necessary to determine the serum titer of universal donors beforehand and to use only donors without a high serum titer for emergency transfusions. It should be noted that the otherwise valuable biological test does not seem to be of any value in these cases.

8. Anaphylaxis. While the literature reports several cases in which the same patient has tolerated repeated transfusions (up to 60) without disturb-

ances, severe anaphylactic conditions (anaphylaxis and allergy) may occur and may cause death. Of 23 cases, 10 were fatal. At the present time we are unable to prevent this complication, although some progress in this direction has been made.

9. Nephritis. One of the most serious complications is acute hemorrhagic nephritis without hemolytic manifestations. Of 6 cases, all were fatal. This complication should always be kept in mind. In the presence of nephritis, blood transfusion requires great caution.

10. Technical faults of blood transfusion. A. Air emboli. The introduction of a small quantity of air is possible in every method of transfusion, but is usually not injurious. Only with gross technical errors can serious danger arise. In 2 cases cited, fatal air embolism resulted from the introduction of 3 cm. of air. Certain important rules must be followed. The rubber tubing must be carefully

filled before the blood transfusion. A small amount of blood must be left in the tube at the end of the transfusion. The pressure-pump apparatus must not be used with the citrate method of transfusion. B. Acute cardiac dilatation in rapid blood transfusion. This occurs especially when a vein near the heart is used (jugular vein) and in myocarditis. As a rule the rate of transfusion should not exceed 100 ccm. in five minutes. The quantity of transfused blood plays no important rôle. Three cases with fatal termination were found in the literature.

11. Unknown causes of complications. In spite of correct selection of the donor according to the principles of group determination and the use of group-related blood hemolysis occurred in 48 cases and 31 of the patients died. The causes of death are as yet unexplained. The author suggests that the selection of the donor may not have been accurate.

G. ALROV (Z)

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Lillenthal, H.: *Electrosurgery Ann Surg* 1933
xviii, 801

On the basis of 118 operations performed with the aid of electrosurgery Lillenthal draws the following conclusions

1. The rapidity and character of healing in cutaneous wounds depends upon the speed with which the incision is made.

2. Only an instrument with extremely frequent oscillations is suitable for making the incision.

3. The rate of healing of properly made wounds is equal to that of wounds which are made with a scalpel.

4. The firmness of the immediate adhesion of the cutaneous edges compares well with that of ordinary incised wounds.

5. Wounds made slowly or with an instrument with insufficiently rapid oscillations do not heal as well as those made with the scalpel.

6. The histological appearance of healed wounds made electrically differs from that of incised wounds, but does not indicate tensile weakness or any other undesirable quality.

7. A wound which is made electrically is more likely to be aseptic than a wound which is made with the knife.

8. In checking hemorrhage from the smaller vessels electrical coagulation is much more speedy than, and quite as satisfactory as, ligation. However large vessels should be tied.

9. In sloughing wounds there is danger of recurrent or secondary hemorrhage no matter what method was employed. Most surgeons prefer ligation in such conditions. Electrocoagulation is absolutely aseptic; no ligation has the same degree of certainty.

10. When local anesthesia is employed in the section of muscle there is a sensation of electrical shock accompanied by contraction of the muscles as they are divided. Therefore general anesthesia is preferable in electrosurgery.

With regard to precautions to be observed in electrosurgery the author makes the following statements.

1. It is believed that in the immediate neighborhood of the heart dangerous phenomena may occur because of muscular stimulation of this organ.

2. No metal instrument in contact with the skin or with other instruments should be touched with the electrode.

3. The electrode fastened to the patient's arm or leg must be firmly secured and kept from contact with wet drappings.

4. No electrical spark should be employed near an explosive anesthetic or explosive cleaning fluids.

5. When work is done in the mouth electrical contact with dental fillings and metal prosthetic appliances must be avoided.

In conclusion Lillenthal says that operators inexperienced in electrosurgery seem to have the impression that this type of procedure is of importance only for the extirpation of malignant growths and should not be employed when first intention healing is to be desired. As a matter of fact, electrosurgery as a routine represents a distinct advance over the more commonly used methods.

HOWARD A. MCKINNEY, M.D.

Negus, V. E.: *Bronchoscopy in the Diagnosis and Treatment of Postoperative Lung Complications. Proc Roy Soc. Med Lond.*, 1933, xxvi, 1127

Negus discusses the causes, nature, prevention, and treatment of postoperative lung complications.

The natural defences of the lung, such as the protective closure of the larynx, cough, mucus secretion, and ciliary action, and their protective rôle in the normal lung and in the lung during general and local anesthesia are described.

Under local anesthesia the larynx is often rendered insensative, and blood, pus or foreign bodies readily enter the trachea and bronchus.

Secretions and foreign bodies may be dislodged by cough, but this protective mechanism may also fail. Anything entering the larynx during inspiration is sucked through the trachea and bronchus as far as their caliber allows. On expiration, the bronchial walls decrease in diameter and hold the foreign body more firmly. The more violent the cough the more firmly the foreign body is held.

Ciliary action, which is an important aid in the removal of bacteria from the lung, is interfered with in the presence of large amounts of secretion, in an acid medium, and in the presence of liquid ether or chloroform. The walls of a bronchiectatic abscess are lined by transitional or squamous epithelium without cilia.

The results of inefficient defence of the lungs and methods of treatment are discussed:

1. Foreign body. If the presence of a foreign body in the tracheobronchial tree is suspected, a bronchoscopic examination should be made at once to confirm or disprove the diagnosis. If a foreign body is found it should be removed early in order to prevent the suppuration which will inevitably follow if it is allowed to remain.

2. Diffuse suppurative bronchitis. This condition may develop after general anesthesia as the result

of the irritation of liquid ether or chloroform paralysis of the cilia, or the aspiration of blood, pus, or vomitus. Dental sepsis is very apt to give rise to such an infection.

Bronchoscopy is of great value in cases of severe postoperative lung suppuration. Removal of the pus and secretions prevents the patient from drowning in his own secretions. The secretions may be repeatedly aspirated through a rubber catheter if a tracheal cannula is in place.

In acute inflammation the oedematous bronchial walls may come together during cough and prevent the escape of the distal secretions.

3. Lung abscess and bronchiectasis with bronchiectatic cavities. The most common cause of these postoperative complications is an aspirated infected blood clot or foreign body. Entrance of blood and pus alone may cause bronchitis, but is not apt to produce an abscess unless a bronchus is partially or completely blocked. The block cannot be expelled by cough, inhibitory mucus cannot reach the bacteria entangled in the clot, and ciliary action is of no avail. Even after the clot disintegrates, swelling of the bronchial walls usually prevents drainage and aeration of the distal lung tissue. Granulations frequently appear and further obstruct the bronchus. Cough may raise the pressure of retained secretions or air distal to the obstruction and thus blow out the weakened walls to form bronchiectatic cavities.

Bronchoscopy should be used early in these cases to establish adequate drainage of entrapped infected materials. Granulations in the bronchial wall should be painted with a 10 per cent solution of silver nitrate. Repetition of the procedure may be necessary.

4. Massive collapse. If medical treatment does not remove the plug from the bronchus a bronchoscope should be passed under local anesthesia and the material aspirated and removed.

5. Multiple bronchiectasis. Diagnostic bronchoscopy and drainage should be instituted in all cases. The aspiration of pus, destruction of granulations with a 10 per cent solution of silver nitrate, and dilatation of stenosed bronchi afford considerable relief. Bronchiectasis is difficult to treat usually nothing more than an alleviation of the symptoms can be obtained.

A brief summary of various means of preventing postoperative pulmonary complications is given.

During tooth extraction packing of the pharynx is an important precaution. In tonsillectomy performed under local anesthesia care to avoid coagulation of the larynx lessens the danger of aspiration. Also of importance is a dependent position of the head during operations on the mouth under general anesthesia. Dental sepsis should be treated before operation. In operations on the nose and mouth, endotracheal anesthesia is a safeguard and suction should always be used to remove excess secretions. The administration of large doses of morphine and atropin is inadvisable. Carbon dioxide inhalations at the termination of anesthesia are of value.

MARY E. MATHEWS M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

Ternovskij S.: A Chalk Dressing for Burns (Der Kreideverband bei Verbrennungen) *Nov chir Arch* 1932 xxvii 381

For the treatment of second and third-degree burns the author recommends powdered chalk, which he has used with good results in the treatment of over 400 children in the last five years. The advantages of this treatment are limitation of the absorption of toxic decomposition products from the wound, rapid healing with minimal pain, cheapness, convenience in the handling of the dressing, and ease of nursing. The chalk dressing is prepared in the following way.

A long layer of cotton from 1½ to 2 cm thick and covered with 1 or 2 layers of gauze is dusted or rubbed with powdered chalk as is done in the preparation of plaster bandages. It is then folded up and placed in a steam bandage-sterilizer for half an hour under somewhat more than 1 atmosphere of pressure. In this way the bandage is sterilized while the chalk is rendered harmless without being altered in its chemical composition.

After the usual cleansing bath, the chalk dressing is laid on the burnt surface, covered with another layer of cotton and fixed with a gauze bandage. The dressing is left in place for from three to ten days or longer. It is then changed in a water bath in which it is easily freed.

In non infected cases 1 or 2 dressings are sufficient to bring about healing. In third-degree burns the chalk is replaced by a neutral salve as soon as granulations are formed. In burns of the face the surface is dusted with sterile chalk instead of being treated with the chalk dressing. A 10 per cent scarlet red ointment is used to stimulate epithelialization.

As the author's cases of burns in children have been very severe, the mortality has been 40 per cent. G. Auzov (Z)

Hinstorff D: The Relationship of the Prophylaxis of Tetanus to the Differences in the Regional Incidence of the Disease (Die Abhängigkeit der Tetanusprophylaxe von der Verschiedenheit des regionalen Vorkommens der Erkrankung) *Chirurg* 1933 v 9

The tetanus bacillus is ubiquitous yet there are countries and regions in which tetanus is much more common than in others. This was evident in the World War. Tetanus is frequent in western countries and rare in eastern countries.

In discussing the question whether serum prophylaxis should be given in every case of injury the author states that as early as 1926 failure to give such treatment was characterized by physicians and prominent jurists as negligence. Of the physicians replying to a questionnaire on this problem which was sent out by Hinstorff only 39 per cent stated that they regarded prophylaxis as necessary.

in every case of considerable injury but all agreed that it is necessary in every case of field or street injury. Sixty per cent stated that it should always be given in machine injuries, and 33 per cent stated that it should be given in household injuries.

The author calls attention especially to the fact that in 147 cases of anaphylactic shock which were listed in the replies to the questionnaire there were 8 deaths. Therefore prophylaxis itself is not entirely without danger. However the danger is decreased if the protein content of the serum used does not exceed 5 per cent.

The author's conclusions with regard to the geographical distribution of tetanus are of interest. He states that a study should be made not only of the under-surface earth but also of the surface earth. Young came to the conclusion that tetanus is particularly common in regions with chalky earth and it is true that during the war cases of tetanus were especially numerous in the chalky Champagne region. Bulloch and Cramer concluded that tetanus infection is favored by calcium salts. This theory is supported by the fact that in Germany's chalky island, Rügen, tetanus is frequent. However in the author's opinion, a relationship between tetanus and geology has not been proved, and even bacteriological studies of samples of earth are not decisive. Virulence is the important factor.

In a study of the incidence of tetanus in a particular region the density of the population must be

considered. Corrected on this basis, the figures received by the author in reply to his questionnaire show that the incidence of tetanus in Hannover is 0.61 per cent. In Westphalia, 0.63 per cent in the Rhine province, 0.78 per cent in Bavaria, 0.81 per cent in Brandenburg 0.83 per cent in Hesse-Nassau 0.84 per cent in the Province of Saxony 0.86 per cent in East Prussia, 0.87 per cent in Saxony 0.88 per cent in West Prussia, 0.90 per cent in Pomerania, 1 per cent in Mecklenburg, 1.11 per cent in Oldenburg 1 per cent in Württemberg 1.11 per cent in the Saar region, 1.23 per cent in Holstein 1.43 per cent and in Silesia, 1.56 per cent.

Hinshelwood concludes that tetanus prophylaxis is not equally important in all regions. The physician should base his decision not only on the character of the wound, but also on the conditions present in the geographical region. In regions where tetanus is endemic, prophylactic treatment should be given in every case of injury whereas in regions where the infection occurs only occasionally it should be given in cases of wounds which have come into contact with the ground. In regions where no case of tetanus has occurred for years, it is superfluous. In injuries sustained in accidents with vehicles of transportation it should be given in every case even though the accident may have occurred in a region free from tetanus.

FRANK (2)

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Holzfelder H.: The Systematic Determination of an Optimal Rhythm for the Irradiation Therapy of Malignant and Benign Diseases (Die planmässige Bestimmung eines optimalen Rhythmus fuer die Strahlentherapie bei malignen und benignen Erkrankungen) *Strahlenkherapie*, 1933 xlvii 71.

On the basis of the present stage of the scientific study of irradiation therapy the author concludes that the timely rhythm of the irradiation dosage is disputed so vehemently because investigators draw their conclusions from very different experimental conditions and there is no satisfactory standard for quantitative estimation of the irradiation dosages administered in different rhythms. In itself a reduction of the average wave length of an irradiation mixture to below about 0.07 Angström units or an increase of the half value layer above 10 mm. copper by reduction of the wave length causes no variation in the biological reactions. On the basis of Reiser's investigations regarding skin erythema as a comparative standard, the author compares continuous irradiation with interrupted roentgen irradiation (simple fractional irradiation over a long period of time, protracted fractional Coutard irradiation, and the saturation method of Pfahler and Klingery).

The Frankfort method, which has been used for malignant tumors during the past seven years, is described in detail. The average total duration of an irradiation series ranges from two to six weeks, and the average total dose at the disease focus ranges from 3 to 6.5 skin-unit doses or from 1,600 to 4,000 r measured in air. On the first day the disease focus is given an irradiation dose of from 50 to 60 per cent of the skin-erythema dose; on the second day, only three-fourths of this dose; on the following day, only one-half of this dose; and finally still less. After from two to three weeks the individual fractions are given at intervals of twenty-four hours, and toward the end of the treatment, at intervals of forty-eight hours.

The most effective total duration of the series per disease focus is presented in a table. In crossfire irradiation of a deep tumor the individual field is given each time up to from 300 to 330 r measured in air and the fields are so treated that a few days elapse between repeated irradiations of the same field. The skin erythema is used as a guide.

Schemes for the procedure according to the number of fields are given. Rhythmical distribution of the irradiation dose is of decided importance for successful results not only in cases of malignant tumors but also in the numerous indications for irradiation therapy in cases of benign disease processes.

WERNER (G)

RADIUM

Wallgren A.: The Biological Effects of the Gamma Rays (Zur Kenntnis der biologischen Wirkungen der γ Strahlen) *Acta radiol* 1933 xiv 111

The investigation herewith reported, which was carried out at Radiumhemmet, Stockholm, was a continuation of the author's previous research regarding the biological effects of roentgen and light rays. The tests were made on granulocytes (neutrophile leucocytes) of normal blood. The irradiation was carried out with one of the radium applicators of the Radiumhemmet which contained thirty-four tubes of 50 mgm. of radium element each. The minimal distance between the lower poles of the tubes and the preparation was 3 mm. The filter was equal to 1 mm. of lead. During the irradiation the preparations were heated to 37 degrees C.

When the irradiation was continued for fifteen minutes some of the granulocytes became immobilized, but after the irradiation was discontinued they soon became normally active again. Under irradiation for from thirty minutes to an hour a great many of the granulocytes became immobilized, but after the exposure was stopped most of them became quite active again. When the irradiation was continued for an hour and a half the same phenomenon was observed, but after fifty minutes a number of the cells were either dead or in the course of disintegration. The most marked effect was obtained with irradiation for from two to two and a half hours. When the irradiation was discontinued after that length of time most of the granulocytes were either severely damaged, dead, or in the course of disintegration.

The results of the experiments with gamma rays correspond in every way with those obtained in the author's previous experiments. The first demonstrable biological effect of irradiation with either roentgen, light, or gamma rays was the immobilization of the granulocytes. Structural changes did not become evident until later.

Thomas, H. E. and Bruner F. H. Chronic Radium Poisoning in Rats. *Am J Roentgenol* 1933 xxix 641

Since soluble radium salts have been used in the treatment of disease for a number of years and since a number of watch-dial painters have died from the ingestion of radium, chronic radium poisoning has received considerable attention. Following a brief review of the literature dealing with the amount of radium given in therapeutics, the authors report studies on the excretion of radium and its disposition in the body before it is excreted. These studies were carried out with a view to producing chronic

radium poisoning by the administration of small amounts of radium over a long period of time. The experimental animals were young rats. Five micrograms of radium chloride were injected at irregular intervals. A total dosage of from 40 to 60 micrograms was given over a period varying from one hundred and seventeen to one hundred and ninety one days. The rats were observed clinically at tempts at mating were made the radium content of various parts of the body and of the whole body was determined photographic plates of the rays emitted from the bones were developed studies were made of the red and white blood cells weight changes were noted changes in the bones were studied gross and microscopic examinations were made of the various organs, especially the bone marrow spleen, kidneys, lymph nodes, and sex glands and the rate of excretion and the quantitative retention of radium in the body were recorded. The findings are shown by tables, graphs, roentgenograms, and photomicrographs.

In discussing the results the authors state that it is difficult to interpret the blood findings in the light of the pathology of human blood. Concentration of radium in the ends of the bones accounted for the earlier destruction of the bone marrow at these points. Lymphocytes were destroyed in large numbers. The mucus-secreting cells of the submaxillary glands and the cells of the medulla of the suprarenal glands were more susceptible than the other cells of these glands. The injury of the liver indicated a decreased secretory and storage function of that organ. The kidneys showed acute parenchymatous nephritis. Females were not rendered sterile but normal gestation was prevented. Degenerative changes in the testicles indicated that the rats would have been rendered sterile if they had lived long enough. Changes in the periosteum and endosteum indicated an irritative condition or a compensatory reaction in these locations. A marked decrease in calcified bone in the central portion of the bones was evident. Ninety nine per cent of the radium in the entire body was located in the bones. A low content of radium in the mandible is explained by the low concentration of radium in the ash of the teeth which makes up most of the weight of the total ash.

A typical secondary anemia occurred in the injected rats. The experimental animals gained weight more slowly than the controls and lost weight very rapidly before death. There was a decrease of calcification in the central portion of all bones, and a concentration of calcium salts was found in the parts of the bones nearest the joints. Abscesses were formed in the soft tissues around the mandible. The central two-thirds of the shafts of all long bones showed hyperplastic bone marrow. The extremities and all other parts contained aplastic marrow. A great destruction of lymphocytes in the spleen and lymph nodes with an increase in lymphoblasts and plasma and giant cells was found. The organs dealing with calcium metabolism the kidneys, and

the intestines were found to contain a higher concentration of radium than other soft tissues. The concentration of radium in the fetuses of a radioactive female was only 3.6 per cent of the concentration in the parent. The quantity of radium retained by each rat averaged 24.6 per cent. During the first week radium was eliminated to the extent of from 50 to 65 per cent. The normal elimination established for 2 animals was 0.6 per cent per week.

The types of rays which may produce systemic changes are described. The authors concluded that the alpha particles are of chief importance as they liberated 90 per cent of the energy of the radium.

A. JAMES LARKIN, M.D.

MISCELLANEOUS

Menndell, J.: Joint Manipulation (Upper Extremity). *Proc. Roy. Soc. Med.*, Lond., 1933, xvi, 851.

Menndell points out that conservative use of manipulation, in skilled hands, becomes a safe remedy which should be used more frequently.

To treat a patient scientifically the first essential is accurate diagnosis. This is possible only by a thorough study of the physiology of joint movement, including movements which are not under voluntary control and the attachment of the ligaments of the joint.

This article describes in detail all movements of the joints of the upper extremity and gives an explanation of beneficial manipulations.

Numerous plates are included.

GUYTON BRAD, R.N.

Schinz, H. R.: The Operative and Irradiation Treatment of Cancer (Operative und radiotherapeutische Behandlung der Krebse). *Strahlentherapie*, 1933 xiv, 7.

The author rejects the numerous proposals which have been made for the prevention of cancer except for the small number of occupational cancers. He emphasizes that the combating of cancer requires the elimination of all disputes of competency between the surgeon and the irradiation therapist, recognition of their equality and their cooperation.

The indications recognized by Fornell for radiotherapeutic and operative methods are presented schematically. In operable and inoperable cases of carcinoma of the skin, lips, and cervix, which constitute 10 per cent of cases of cancer, the treatment of choice is irradiation alone. In cases of carcinoma of the stomach, colon, rectum, kidneys, bladder and prostate, which constitute 43 per cent of cases of cancer, surgery alone is the treatment of choice when the condition is operable and irradiation is being worked out for those which are inoperable. In cases of carcinoma of the oral cavity, thyroid gland, breast, ovary and vagina, which constitute 35 per cent of cases of cancer, the treatment of choice is a combination of irradiation and surgery.

On the basis of statistics from the literature of the world which he presents in tabular form, the author

shows the advantage of irradiation therapy as compared to operation in cancer of the lip and cancer of the cervix. He compares the five year cures obtained at the Radium Institute of Paris with those obtained by operation at the Brocca Hospital in Paris. The same conclusion may be drawn with regard to irradiation and operation in the treatment of malignant tumors of the oral cavity. The advantage of irradiation is especially evident in carcinoma of the larynx and pharynx.

The frequency with which different methods of treatment were used in 350 cases admitted to the Zurich University Surgical Clinic is shown in a table. Fourteen and three tenths per cent of these cases were treated by operation alone, 43.4 per cent by irradiation alone, and 33.4 per cent by both operation and irradiation.

Next, the special therapeutic measures and their results are grouped according to organs. A new classification for carcinoma of the breast is presented.

This is based on separation of the primary tumor stage from the stage of regional metastases and permits a comparison with the usual Steintal stage. The primary stage is designated by Roman figures and the stage of glandular involvement by Arabic figures. The author calls attention especially to the episcritical proposals for the treatment of carcinoma of the breast—for Stages Ia, Ib, 2a and 2b radical operation by sharp dissection or with the electro-tome for Stages 2c, 2b etc. and Stages 3a, 3b, 3c, etc. preliminary fractional irradiation to render the condition operable followed by operation for Stage 4, only protracted fractional irradiation for a palliative effect and for postoperative recurrences irradiation (for small recurrences the highest roentgen dose).

In conclusion all of the cases of carcinoma irradiated and followed up during the year 1931 are summarized in a table. Of 476 patients, 139 were free from symptoms.

HEINZ KIRSCHMANN (G)

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Nissen, R.: The Blood Reservoirs in Man (*Die Blutreservoirs des Menschen*) *Klin. Wochschr.*, 1933, 1, 16.

Nissen a surgeon discusses the blood reservoirs in man from the purely mechanical standpoint, that of gross physical relationships. He first compares pathological reservoirs to physiological reservoirs. As pathological reservoirs, he cites varicose veins, in which as much as 1½ liters of blood may be retained, the signs of stasis in heart tamponade and encroachments on the space around the heart which cut off the return of blood to the heart. In cases of acute heart tamponade both of the vena cavae are usually strangled, whereas in chronic cases, such as those of mediastinopericarditis, only the inferior vena cava is involved. Of special interest are the pathological venous reservoirs in arteriovenous aneurysms which, according to Wolfheim, may increase the absolute amount of blood by from 20 to 30 per cent. This pathological blood storage may be likened to failure of the normal reservoir function. The latter is of importance in the severity of operative trauma which depends to a considerable extent on the quantity of blood in circulation. The quantity effect is made evident by simple exsanguination experiments and anesthesia experiments. Nearly every deep general anesthesia causes an overfilling of the blood vessels of the muscles such as occurs in freezing, which is compensated by contraction of the skin capillaries. If the skin capillaries are opened by heat stimulation, a dangerous fall in the blood pressure occurs. The conditions are similar in shock.

From these observations a new theory has been evolved with regard to spinal anesthesia. According to this theory there is a marked hyperemia of the lower extremities, the intestines, and the pelvic organs which is due to a vasomotor paralysis. As a result, blood cannot be supplied to the heart from these regions in moments of particular stress by contraction of the blood vessels. The blood pressure therefore falls and collapse occurs. The renal vessels do not participate, a fact to be considered in prostatectomies performed in the presence of renal injury.

Peritonitis leads to injury of the entire capillary system. The lung is able to adapt itself in a crude mechanical manner to the quantity and rapidity of circulation of the blood. This is evidenced in massive atelectasis. On the pathological side there is an increase in the negative intrathoracic pressure which produces a suction action that, like paralysis, causes a dilatation of the blood vessels. Respiration

under positive pressure could not be resorted to safely without the physiological blood reservoirs of the liver and spleen. Forcible alteration of the intrathoracic pressure, especially lowering of the pressure within the respiratory passages, sucks out large quantities of blood into the pulmonary circulation and considerably reduces the bleeding in brain and spinal cord operations. Similarly the quantity of circulating blood may be reduced, by as much as 2 liters by tying off the extremities. This method has been employed by Joesprits and others to lessen the dangers of general anesthesia. It reduces the quantity of anesthetic necessary and the liberation of the blood of the extremities into the general circulation on release of the ligatures hastens detoxication.

According to the physiologists, the spleen is one of the chief reservoirs of blood, but as a normal spleen may be extirpated without causing a marked change in the quantity of circulating blood, it is evidently of less importance as a blood reservoir than seems apparent from experiments on animals.

FRANK (2).

Eliaeson, E. L.: The Surgery of Diabetic Gangrene. *Ann Surg* 1933, 97, 11.

This report is based on 170 cases of diabetic gangrene operated upon at the Philadelphia General Hospital. This group constituted 23 per cent of the cases of diabetes admitted to the hospital. In 95 per cent of the cases the gangrene occurred in the lower extremities. One half of the patients did not know that they had diabetes until the gangrene occurred. Infection was a complication in 87 per cent of the total number of cases and in 95 per cent of the fatal cases.

The author concludes that early surgical treatment is essential in diabetic gangrene, but the patient must be properly prepared for it. The pre-operative preparation should include the administration of insulin, carbohydrates, fluids, and penicillin antitoxin.

Of the cases reviewed, a mid-thigh amputation was done in 76 per cent. In infected cases drainage was established. Spinal anesthesia was used in 80 per cent of the cases and local anesthesia in 17 per cent.

According to statistics diabetics with gangrene have had seven years added to their lives by modern methods of treatment. In the cases reviewed the operative mortality within twenty four hours was 3.5 per cent the hospital mortality 41.8 per cent and the mortality within a year after the operation, 55 per cent. Only 10.4 per cent of the last 67 patients were alive after eighteen months.

MANUEL E. LICHTENSTEIN, M.D.

Andrews, C. H. Further Serological Studies on Fowl Tumor Viruses *J. Path. & Bacteriol.*, 1933 xxvii, 17

The studies reported were carried out to determine whether the neutralizing properties in the sera were true antibodies, and whether the viruses were identical or merely antigenically related.

The results indicated that viruses from the different tumors studied were serologically neither identical nor yet wholly distinct. The sera showed a certain degree of specificity which may be regarded as further evidence that their neutralizing properties are due to true antibodies and not to a non specific inhibitor. We have the analogy of the bacteriophages. All fowl-tumor viruses have some degree of antigenic relationship, but no two have yet been found to be serologically identical. The author believes that they are probably interrelated much as are members of the same group of bacteria.

M. HERBERT BARKER, M.D.

Kaplan, I. I. A Report of Over 1 000 Unselected Cancer Cases Treated in 1931 and 1932 at the New York City Cancer Institute, Welfare Island *Radiology* 1933 xi, 433

The study of 1 236 cases admitted to the Cancer Hospital on Welfare Island, New York, shows that cancer is an important cause of death in all races. However certain cancers are more frequent in some races than in others or more frequent in one sex than the other. For example, cancer of the cervix is frequent in Jewish women, cancer of the skin, mouth, and tongue is quite uncommon in the colored race, and cancer of the breast is much less frequent in males than in females.

The frequency of involvement of the different organs in the cases reviewed by the author was as follows: cervix, 17 per cent; breast, 11.9 per cent; stomach, 8.7 per cent; rectum, 8.4 per cent; tongue, 4.8 per cent; face, 4.8 per cent; prostate, 4 per cent; ovary 3 per cent, and esophagus, 1.1 per cent. The other organs were less frequently involved.

In cases of cancer of the bp the results of interstitial radium therapy were less successful than those obtained by surface radium therapy.

Of the cases of malignancy of the tonsil, all but 2 were those of men between fifty and sixty years of age. In the majority the lesion was a squamous celled epithelioma.

In cases of malignancy of the esophagus, favorable results were obtained only when gastrostomy was performed early before complete dehydration had occurred. In most instances emergency gastrostomy was followed by rapid death. As a rule the treatment consisted of gastrostomy, forced feeding and X ray irradiation through the mediastinum. In a few instances radium therapy was attempted, but the results were not encouraging.

In cancer of the stomach, early diagnosis and early radical operative treatment are essential to lower the death rate. The author has found irradiation of little avail.

In most of the cases of cancer of the rectum radium treatment was given with the proctostat which eliminates radium necrosis to a great extent and entirely prevents perforation necrosis and associated peritonitis. Death was due in most instances to cachexia and extension of the local lesion.

Cancer of the breast occurred more frequently in white women than in colored women and slightly more frequently in Gentile women than in Jewish women. The right and left breasts were involved with equal frequency. Bilateral involvement was uncommon. The condition was most frequent between the ages of forty and fifty years. The most common lesion was an adenocarcinoma. Next in frequency were the duct-cell and scirrhous types of cancer. The best results were obtained in cases treated by pre-operative irradiation and careful surgery. Endothermic surgery was of value for ulcerated bulky tumor growths but did not give increased assurance against the development of metastases.

Ovarian malignancy occurred twice as frequently in married women as in unmarried women and 5 times more frequently in white women than in colored women.

Cancer of the cervix occurred most often in white Gentile women who were married and had borne children. The lesion was most frequently a squamous-celled epithelioma and next most frequently a pleomorphic carcinoma. Adenocarcinoma was found in only 11 cases.

In no case of carcinoma of the penis was the Wassermann test positive. In some cases dissection of the regional nodes was done. High voltage X ray therapy was used in all cases, and local radium applicators were employed in several. Only 2 patients survived. Ten rapidly succumbed to secondary infection and metastases.

JOSEPH K. NARAT, M.D.

GENERAL BACTERIAL, PROTOZOAN AND PARASITIC INFECTIONS

Schnitzle, W. The Anatomical Conditions for Metastasis in General Infection (Ueber die anatomischen Bedingungen fuer die Metastasierung bei der Allgemeinfektion) *Deutsche Zeitschr. f. Chir.*, 1933 cccxxxix 34.

This work is based on experiments on rats injected intravenously with small amounts of India ink after special preparation and on 365 clinical cases of general infection. They show that the shape of the capillaries is of importance in the frequency and type of bacterial lodgment in blood infection. The India ink injected into the rats was deposited in the individual organs in varying quantity and form depending upon the structure and form of the capillaries. The following 3 types of capillaries were distinguished:

1. Wide capillaries with a slow current and a close relationship to the reticulo-endothelial system. To these belong the capillaries of the liver, spleen, bone marrow, and lymph glands. In such capillaries

the India ink was deposited in a finely divided form, but was soon and quickly carried off by the blood or lymph route. In blood infection in man these organs undergo changes manifested by marked cellular reactions in the reticulo-endothelial system, but seldom show abscess formation.

2. Elongated, loop-forming capillaries with wide variations in width and a close relationship to the reticulo-endothelial system. To these belong the capillaries of the lungs and kidneys. In the animal experiments the lumina of the capillaries in this group were found in places completely obstructed by the India ink. However the India ink was rapidly eliminated because of the close relationship of the vessels to the reticulo-endothelial system. In blood infections in man, abscesses in these organs are frequently found in addition to cell proliferations in the reticulo-endothelial system.

3. Elongated narrow capillaries with only a slight relationship to the reticulo-endothelial system. To these belong the capillaries of muscles, peritoneum, and brain. In the animal experiments a more

or less extensive complete occlusion of the capillaries by emboli of India ink was found in these organs. The elimination of the India ink was delayed, but the total quantity lodged in the organs was small. In agreement with these findings, the number of bacterial lodgments in these organs in clinical cases is relatively small, but abscesses always develop at these sites.

Further animal experiments yielded additional evidence of the importance of a focus of diminished resistance for the lodgment of bacteria from the blood in general infection. When necrotic areas were produced in an organ the experiments showed that the capillaries in the vicinity widen out, whatever the capillary form proper to the organ, and take an extraordinarily rich deposit of India ink.

Finally anatomical researches and investigations on freshly amputated legs showed that on contraction of the muscles of the legs there is a decrease in the negative intravenous pressure which favors the entrance of infectious material into the circulation.

E. KONRO (Z).

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International Abstract of Surgery

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INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1933

COLLECTIVE REVIEW

THE PHYSIOLOGY OF THE URINARY TRACT AND ITS PRACTICAL APPLICATION

FRANK M. COCHEMS, M.D., CHICAGO

KIDNEY

VIDAL studied the blood vessels and excretory system of the kidney in detail by means of injection preparations, dissection, and X rays, and came to the following conclusions:

The renal arteries, particularly the polar arteries, vary greatly in number, origin, and site of entry into the parenchyma, but once within the kidney substance they follow a fairly straight course. In the medullary zone are given off fine terminal branches without anastomoses. The pelvic region has an arterial supply of its own. Around the pyramids and smaller calyces the veins form arches which receive branches from the cortex on their peripheral portions and branches from the medullary zones on their central parts. An abundance of venous anastomoses facilitates compensation within the venous system.

Vidal emphasizes the necessity of watching for supernumerary vessels, especially in hydronephrosis. He states that the fairly straight direction of the arteries within the kidney substance and the division of these vessels into an anterior and posterior plexus explain how nephrotomy can be done in an almost bloodless area. The medullary zone is vascularized not only by the efferent branches of the glomeruli but also by fine branches given off by the renal arteries. Consequently this zone receives a sufficient blood supply even when the flow through the glomeruli is impeded by cortical pressure. Because of the distribution of the posterior renal arteries pyelotomy should be done preferably on the posterior surface of the pelvis.

Cysts of the kidney Colston reports six cases of calcified cysts of the kidney. Calcified cysts are formed by hemorrhage into simple serous cysts or as the result of the natural evolution of a perirenal hematoma. In the last of the six cases presented by Colston the direct etiological factor was certainly trauma. The symptoms are due to the pressure and weight of the cyst. The mass can usually be palpated at times by the patient himself and a good flat roentgenogram will show its outline. The treatment indicated is excision. Prevention of the development of calcified cysts depends upon the removal of simple cysts before hemorrhage occurs into them, and correct treatment of the traumatized kidney.

Renal vein injury Orofino studied the changes in the kidney and the systemic effects of ligation of the renal vein. He states that Alessandro Giani, Morel Papin and Verliac, performing ligation through the peritoneum, noted a marked development of the secondary veins which allowed survival of the kidney. However this operative method is not applicable to human beings. In experiments on dogs, Orofino performed unilateral ligation of the renal vein by the lumbar route collected the urine of both kidneys by means of an extrophy of the bladder, and studied the functional renal changes. He found a decrease in the elimination of salt solutions by the kidney operated upon and hyperfunction of the other kidney. No histological alterations coinciding with the functional changes were noted.

Orofino states that in cases of damage or a lesion of the renal vein nephrectomy should be done.

as ligation of the vein may be followed by a toxic effect on the organism produced by the kidney.

Diuretic cerebral hormones. From experiments on rabbits Mingazzini concluded that certain diuretic cerebral hormones are liberated by damage to a definite center in the fourth ventricle. When Bernard demonstrated that, in rabbits, puncture of a determined point in the floor of the fourth ventricle provoked polyuria associated frequently with glycosuria, the link between the nervous system and renal function was apparently discovered. The various links of the neurorenal chain along which the stimulus passed then remained to be determined. If the stimulus was transmitted in spite of interruption of the nervous system, it would be necessary to admit the presence of an intermediary agent between the reflex and the stimulus. The action of special substances of endocrine origin which brings about an oliguria or polyuria has already been shown.

In 1927 Bourguin demonstrated the existence of hormones. In 1928, Olivet and Frankel completed the study and made experiments showing the presence of special diuretic substances liberated by puncture of the floor of the fourth ventricle and the cerebral uvea. These substances are chemical and have hormonal characteristics, being able to coordinate the activity of certain organs with that of other organs by way of the blood. In the serum of animals subjected to puncture of the floor of the fourth ventricle Olivet found substances which were transferable to other animals and had a strong diuretic action on the latter. From experiments on rabbits he concluded that stimulation of the "saline center" liberates into the blood stream cerebral hormones with a "chlorure" action which, when concentrated and injected into another animal, produce the same changes in that animal, namely an increase in the urinary chlorides and in the fluid output.

Relation of prostatic hypertrophy to renal function. Caley believes there is a definite relation between the degree of prostatic hypertrophy and renal function. He states that the alterations at the neck of the bladder caused by an enlarged prostate change the course of the vas deferens, thereby producing a kink in the ureter which slowly forms an obstruction to normal emptying of the urine into the bladder and creates renal insufficiency. From experiments which he performed on dogs to determine whether the prostate has an internal secretion exerting an effect on renal function he drew the following conclusions:

1. Absence or an increase of the prostatic secretion does not cause notable changes in renal function.

2. Prostatectomy increases diuresis at first and decreases the relative and absolute quantity of urea excreted without changing the uric acid content of the blood.

3. Supplying prostatic serum or transplanting a prostate to a normal or prostatectomized animal provokes oliguria, an increase in the urea excreted, and a change in the blood metabolism.

4. Prostatectomy causes a notable increase in weight, while the administration of serum or transplantation of the prostate causes a decided decrease in weight.

5. The changes mentioned do not warrant the conclusion that the prostate gland has an endocrine function.

Enervation of the kidney. Spinelli described the course and origin of the renal nerves and experimentally studied the effects of chronic irritation of these nerves on the kidney from an anatomicopathological point of view. In experiments on dogs he produced a chronic state of irritation by tying a large silk snare around the point of origin of the renal pedicle. From his observations he concluded that the nervous system exerts an effect on renal function, and that chronic irritations of the renal pedicle produce changes which diminish renal activity. He states that the chronic mechanical irritation of the kidney and sympathetic periaortic nerves causes very definite lesions of a degenerative type.

Following a brief description of the innervation of the kidneys, Lozzi discusses the different theories regarding the anatomofunctional effect of renal enervation and renal decapsulation. In twenty clinical cases of partial enervation and eighteen of decapsulation which he reports, functional tests with indigocarmin and phenolsulphophthalein made over a prolonged period of time and repeated re-examinations revealed no damaging effect of the operations on renal function. From the findings in these cases Lozzi draws the following conclusions:

1. Renal decapsulation and partial renal enervation have the same vasomotor effect on the renal vascular system.

2. Renal decapsulation causes no immediate or delayed damage to renal function.

3. In reflex anuria, renal decapsulation promptly re-establishes diuresis.

Pezcoller states that renal enervation was practiced on man for the first time in 1921 by Papin. By 1926 it had been done in five hundred cases. Carrel, Lebenhofer, Carleton, and Dederer believe that the renal nerves have very little influence on the function of the kidney. Dogliotti and Maiorano confirmed the theory that decortication of

the renal artery stimulates the function of the kidney and that the resection of nerve fibers notably decreases it. They believe that in enervation of the kidney the nerves should be left at limited intervals. Nicio found that periaarterial sympathectomy several months after operation may cause a considerable reduction of renal function. Vitale also found that it reduced the function of the kidney. In some of Pezcoller's experiments the lesions were very slight and in others very marked. In some with evidence of septicaemia only a slight hyperaemia, a little interstitial hemorrhage, and slight leucocytic infiltration around the vessels were found. In others, the lesions were more grave, the parenchyma being reduced to islets. In all, the inflammatory changes were uniformly distributed in both kidneys. In a series of experiments on animals, staphylococci were injected intravenously and unilateral enervation of the kidney was done. Pezcoller believes that the difference in the behavior of the enervated and non-enervated kidney is not attributable to enervation. He concludes that the renal nerves have no effect on bacterial invasion of the parenchyma and do not modify the course of infection in the kidney.

Renal-gastro-intestinal reflex. Tixer and Clavel call attention to the fact that not infrequently in cases presenting symptoms of partial or complete intestinal obstruction alone or dominating the clinical syndrome no intestinal disease is found at operation and the gastro-intestinal symptoms are discovered later to be due to either renal or retroperitoneal factors such as calculus, hydronephrosis, hemorrhage, or infection. They believe that this phenomenon is explained by motor or inhibitory reflexes of the intestine, the point of origin of which is in the sensory nerves of the kidney, ureter or posterior parietal peritoneum. In order to determine the influence of renal and peritoneal stimulation on gastro-intestinal motility they introduced a balloon into the stomach or intestine of a dog and made kymographic tracings of the contractions following stimulation of kidney, ureter and posterior peritoneum. They attribute the occurrence of the reflex to an individual predisposition.

Renal function. Steffanutti suggests the use of two dyes in the determination of renal function. He states that Orzechowsky, Liang, and Schemlnsky demonstrated that the concentration of dyes is always lower in the urine secreted by perfusion of the glomeruli than in the urine secreted by perfusion of the tubules, and that in the tubular portion of the kidney only substances more or less soluble in lipoids are secreted. Steffanutti demon-

strated that the separation of injected dyes is associated with perfect kidney function. In normal animals, the renal elimination of the azophen ('azofucina') was typical of each injection. The kidney of warm blooded animals is not fundamentally different from that of cold blooded animals. In the diagnosis of renal diseases in the higher animals and man, the methods now being employed are based on the use of a single dye such as phenolsulphonphthalein, methylene blue, or indigocarmine. When only one dye is used it is difficult to draw conclusions regarding the degree of function of the renal system and to evaluate dysfunction quantitatively in renal diseases of a medical nature such for instance, as nephrosis. The injection of two dyes offers a new means of comparing the concentration of the urine. The combination of dyes best adapted to the study of renal function is still undecided. Hober stated that urinary secretion is the result of two intrinsic components of the kidney one the glomerular component, the other the tubular component. Steffanutti used an injection composed of four parts of 1 per cent canolo solution (blue) and one part of 10 per cent phenolsulphonphthalein solution (red). These solutions are non-toxic and remain unchanged in their course through the organism. The quantity of phenolsulphonphthalein excreted in the urine quickly attains the maximum and then rapidly decreases, whereas the quantity of canolo decreases very slowly. The results are practically alike in both kidneys. A few minutes after the injection the concentration of phenolsulphonphthalein in the urine is ten times greater than that of canolo. Hober attributes the rapid elimination of phenolsulphonphthalein to concentration by the epithelium of the renal tubules. The canolo is eliminated by the kidney slowly as through a filter, without accumulation or concentration. It therefore appears that the function of one component of the kidney is the massive and rapid elimination of substances excreted from the blood and highly concentrated, while that of the other component is a constant slow filtration of substances remaining in the urine at a concentration equal to or a little higher than that in the blood. The injection of two dyes shows that in the normal kidney these two functions are equal, whereas when one of the two parts of the kidney is abnormal they are unequal. The method is simple and permits an exact quantitative evaluation of renal function. The findings from its use may be summarized briefly as follows:

1. In the higher animals the kidney exercises on dyes injected into the tubular and glomerular regions an action of separation the type of which

depends upon the character of the dyes used and the condition of renal function.

2 The coefficient of separation of injection indicates the relation of balance between the glomerular function (action of filtration) and the function of the renal tubules (secretory action)

Onell, Chabanier and Lelu describe Volhard's functional test of the kidneys as consisting of two parts: dilution and concentration. The dilution part is carried out with the patient in bed. At 8 o'clock in the morning he is given 1500 c.c.m. of water or tea to drink during a period of half an hour. Urine specimens are then collected every half hour for four hours. Normally 1500 c.c.m. or more are eliminated during this time. The diuretic curve reaches its maximum at the third half hour and rapidly falls after the fifth half hour. The specific gravity of the urine varies inversely with the secretion. Any deviation from these rules is regarded as an indication of kidney disease. In the concentration portion of the test the patient is given a waterless diet for twenty-four hours. Normally the specific gravity of the urine reaches from 1.025 to 1.030 m from ten to twelve hours. A lower specific gravity is believed to indicate impairment of kidney function. On the basis of considerable experimental study, Onell, Chabanier and Lelu concluded that Volhard's dilution and concentration test of renal function is not to be recommended as its results are influenced by many extrarenal factors such as fever, myxedema, cardiac disorders and diarrhea.

In a general review of renal function tests, Chavannaz states that according to the differences in the physiological principles underlying them the methods may be classed into two groups: substance threshold methods and methods based upon the determination of "constants." An example of the first group is the sugar tolerance determination, and an example of the second, the determination of the content of urea or any body waste product in the blood. Both groups have advantages and disadvantages. In their use as prognostic guides in general surgery it must be borne in mind that factors such as the age, weight, and general condition of the patient, the time of day at which the test is made, and the presence of toxic substances have an influence on the results.

Muñoz and Dagnino believe that vital phenomena should be studied *in vivo*, and that the intimate mechanism of functional disturbance of the renal parenchyma cannot be deduced from anatomical findings. In studying the basic concepts of renal function, tests were made by: first, partial examination; second, provoked

elimination (coloring); third, tests of dilution and concentration; fourth, study of renal function tests. Besides a hypothetical internal secretion, the kidney secretes numerous other substances, maintains the acid-base balance of the blood, and is of importance in the maintenance of the hydrogen-ion concentration. The Italian school claims that creatin is not toxic, but according to Pasteur and Valéry-Radot, a content of more than 0.09 gm. of creatin in the blood is fatal. In the opinion of Muñoz and Dagnino the presence of creatin in the blood is an indication of toxic retention due to renal dysfunction. The best idea of kidney function is gained from the curve of aqueous diuresis. The secretion of the kidneys conforms to laws and can be expressed by mathematical formulae. When the kidney eliminates urea at a constant concentration the "debit" varies proportionately to the square of the concentration of urea in the blood. When the concentration of urea in the blood is constant, urea is eliminated at variable concentrations and the

debit is inversely proportional to the square root of the concentration of urea in the urine. When the concentration of urea in the blood and the concentration of urea in the urine are equally variable, the urea "debit" varies in direct proportion to the square of the concentration of urea in the blood and in inverse proportion to the square root of the concentration of urea in the urine. In normal subjects this value is 0.070. All substances have a constant of secretion. The secretion of a substance begins only when the concentration of the substance has exceeded the physiological limit. In the opinion of Muñoz and Dagnino Ambard's constant is the most exact index of renal function.

Silva and Hervé, Hellstadius, Harding and Urquhart, and Lebermann have discussed the more common renal function tests and agree that the urea tolerance or urea-clearance test permits the most accurate estimation of renal function.

Tabanelli studied in some detail the method of testing the functional capacity of the kidneys on the basis of the elimination of sodium hypophosphite which was first described by Nyiri in 1923. He believes that intravenous administration of the hypophosphite is best and that when the test is carried out correctly it is equal to the other tests in current use.

Chwalla points out that the border of operability in bilateral kidney disease must depend upon the judgment of the surgeon rather than upon functional tests. He states that the Indigo-carmine test is the most reliable but even this may give false results, as, for instance when the pa-

tent has taken insufficient water or there is bladder retention.

Bureau and Constantinesco review the literature on the immediate functional compensation of the remaining kidney after nephrectomy and report 3 cases in detail. From a comparative study of Ambard's constant and phenolsulphophthalein tests in the determination of functional compensation they draw the following conclusions:

1. When necessary, a normal kidney is able to assume the function of both kidneys in less than twenty-four hours because of its reserve functional capacity.

2. Nephrectomy produces a disturbance in the elimination of inorganic salts and other blood substances on which the integrity of the alimentary tract depends. Twenty-four hours after nephrectomy urea is eliminated in a concentration which can be compared to the maximum or normal concentration. The equilibrium of elimination is re-established in from five to seven hours.

3. In the determination of the functional compensation of the kidney after nephrectomy the phenolsulphophthalein test is of great aid. Ambard's constant is uncertain, probably on account of the disturbance of bowel elimination which occurs in the first days following the operation.

Cartwright describes an original method of estimating kidney function by means of intravenous urography. In this procedure, 15 c.cm. of 2, 3, 4, 5, 6, and 8 per cent skiodan solutions are placed respectively in six vials of similar size and shape, and, in a seventh vial, are placed 15 c.cm. of urine collected thirty minutes after the intravenous injection of skiodan. Roentgenograms are then made of the seven vials simultaneously and the percentage of skiodan in the urine is estimated by comparison. When the kidneys are normal, 40 per cent of the skiodan is eliminated in thirty minutes.

Intravenous urography. Swick presents a preliminary report on the oral and intravenous use of sodium ortho-iodohippurate in excretion urography. He states that he obtains satisfactory roentgenograms in 50 per cent of the cases in which he administers it orally.

Kornblum believes that much of the dissatisfaction and failure in the use of intravenous urography is due to improper roentgenographic technique. One of the most common causes is the bowel contents, especially gas. In the procedure used by Kornblum a plain roentgenogram of the abdomen is made first, and if too much gas is present, a thorough enema is given and the patient then re-examined. If gas is still present after the expulsion of the enema, a purge is adminis-

tered and the examination is put off until the next day. To obtain more complete filling of the pelvis and ureters, a compression bag is used. To eliminate the possibility of error in the reading of the roentgenograms from overdistention of the pelvis by the bag, one roentgenogram is made before the compression bag is used. While the time interval between the taking of the roentgenograms of a series is not important, intervals of fifteen minutes, forty-five minutes and one hour and fifteen minutes after the injection are usually advocated. As a rule the early roentgenograms of a series are the best. Multiple exposures on a single large film are most satisfactory. To be of significance morphological and functional abnormalities must be constant in all roentgenograms. One roentgenogram of the series is taken with the patient in the vertical position to determine mobility, but otherwise the patient is kept in the recumbent position during the entire examination. In the reading of the roentgenograms it is not sufficient to be familiar only with the morphological changes incident to the various pathological processes. One must be competent also to interpret functional activity and to evaluate the effect of such activity on the morphological changes present. Complete and constant visualization of the ureter, which need not be dilated, is indicative of obstruction. Persistent absence of dye in the renal pelvis and ureter indicates congenital or acquired absence of the kidney, permanent loss of kidney function, or temporary absence or inhibition of kidney function. Hyperfunction alone produces an intensification of the pelvic shadow such as is to be seen in compensatory hypertrophy of one kidney when the other kidney is diseased.

Heckenbach states that in intravenous pyelography the ureter is never visible in its entirety if it is normal. Complete filling is pathological, being caused by a disturbance of contractility due to obstruction, infection or toxicity. Almost always the pelvis and upper third of the ureter are filled before segments of small or large size are seen. The shorter the segments the greater the motility and the tendency toward spasm and the longer and wider the segments, the less the motility and the greater the tendency toward atony.

Hydronephrosis. Hosford divides the causes of hydronephrosis into the congenital and the acquired. He limits the term "congenital" to hydronephrosis present in the newborn or discovered soon after birth. Cases of congenital obstruction are divided into (1) those of obstruction in which a lesion such as a stricture, narrowing or fold is found and (2) those of megaloureter and hydronephrosis, in which no mechanical obstruc-

tion can be demonstrated. In the latter, deficient development of the musculature of the ureter may be the cause.

Cases of acquired hydronephrosis may also be divided into two groups (1) those with a demonstrable macroscopic obstruction due to a calculus, neoplasm, or tuberculous inflammation in the ureter ureteral strictures, or ureteral kinks from aberrant vessels or abnormal renal mobility and (2) those with functional obstruction. *Peristalsis* begins in the major calyces near the tips of the papillae, passes downward over the pelvis and the ureter and slows down definitely at the pelvi-ureteral junction. Numerous experiments to determine the effect of its interruption have failed to show even the earliest degree of hydronephrosis.

Hydronephrosis is divided into the renal, pelvi renal, and pelvic types. The renal type is usually due to calculus disease, and the pelvi renal type to definite obstruction below the ureteropelvic junction. The cause of the pelvic type is obscure. Among the causes suggested for idiopathic hydronephrosis are ureteral stricture, abnormal mobility of the kidney aberrant renal vessels, and folds and valves at the pelvi-ureteral junction. While these factors may be responsible occasionally they are not constant findings and are to be considered secondary rather than primary.

Experimentally pelvic hydronephrosis has been produced in rabbits by simultaneous ligation of the ureter and the posterior division of the renal artery. A ring muscle or sphincter has been demonstrated at the pelvi-ureteral junction but hypertrophy of this bundle has not been found and simple spasm is not likely to cause dilatation of the pelvis. The theory that pelvic hydronephrosis might be the result of congenital deficiency of the musculature of the pelvis cannot be proved, and all facts are against it. According to the most satisfactory explanation pelvic hydronephrosis without an apparent primary obstruction is due to achalasia or lack of relaxation with a superimposed secondary infection and an associated disturbance of the neuromuscular mechanism.

To study the changes occurring in the renal tubules in progressive hydronephrosis Johnson ligated and divided the left ureter at the uretero-pelvic junction in a number of young normal rabbits. He found that dilatation began in the glomerulus and convoluted tubules and soon involved the papillary ducts. At the end of a month atrophy began in the glomerulus and proximal convoluted tubule. Atrophy of the secretory portion of the kidney then continued with progressive dilatation of the collecting ducts. At

the end of three months, some of the glomeruli had come into direct communication with the collecting tubules as the result of shortening, straightening and finally disappearance of the convoluted tubules. By the end of five months the communication was entirely lost. At this time also there was maximum dilatation of the collecting tubules. Gradual atrophy and shrinkage in all dimensions then took place.

Cusani observed that in cases of periureteral sympathectomy certain changes in the form of ectasia take place and spread as high as the cortical zone. This observation led him to perform experiments on dogs in which he denuded the ureter of its tunica adventitia. The denudation was followed by hydronephrosis of varying degree and by dystrophic disturbances caused by the interruption of the nerves of the ureter. The dystrophy became a purely dynamic factor causing a disequilibrium which had a harmful effect on the walls of the tubules and glomeruli. Cusani concludes that such a dynamic factor may be responsible for hydronephrosis which has no apparent cause.

McCaughan found that following simple water diuresis the pressure of urine in the renal pelvis increases about 30 per cent. In experiments on dogs he performed bilateral abdominal ureterotomies, and after determining the maximal secretion pressure for the animals, performed a unilateral denervation and then determined the maximal pressure again. He found that following the renal denervation the pressure of the urine was not significantly increased.

Calculus. Papin reports a study of one hundred and thirty-six cases of renal calculi, of which one hundred and twenty nine were treated surgically. He draws the following conclusions:

1. In cases of renal stone radical operations are much more serious than conservative operations.

2. Pyelotomy has almost no mortality.

3. A conservative operation should not be chosen when recurrence is almost certain.

Papin attributes the low incidence of recurrences in his series to the fact that a radical operation was done in half the cases.

Pyelovenous backflow. Sacco states that Blum, in 1913 was the first to determine the mechanism of pyelovenous backflow. He discovered it by finding collargol in the peritubular lymphatic spaces. Sacco says that under normal conditions there is no direct connection between the kidney pelvis and the kidney. With the exception of osmotic and phagocytic processes, the backflow of a fluid under pressure in the renal pelvis probably be-

gins as a rule at the point of least resistance. According to some, fluid introduced under pressure into the pelvis becomes diffused in the kidney through the urinary tubules. The fundamental question concerns the degree of pressure needed to produce pyelovenous backflow. Shiga and Traut demonstrated that, in normal kidneys, the pressure can be greater than secretory pressure and at times may reach 220 mgm. of mercury.

The urinary tubules, interstitial lymphatic system, and renal veins may be considered a mass of spaces and canals through which the pelvic contents can find a more or less complete route of discharge when the normal outflow of the ureters is blocked. The ideal route is through a rupture of the fornix. In the human kidney, the pelvic contents usually pass into the venous system by the retrograde route through a rupture of the fornices, and only exceptionally by canalicular reflux. Under pathological conditions pyelovenous backflow takes place at a pressure less than that necessary for secretion in the normal kidney. A sudden or gradual increase of the endopelvic tension due to a temporary or definite occlusion of the ureter, peristaltic waves, strong contractions of the abdominal walls, direct or indirect trauma to the kidney, or instrumental intervention will cause the pelvic contents to pass directly into the venous system and then into the general blood stream. The direct passage of the pelvic contents into the general blood stream through ruptured fornices protects the renal parenchyma and may retard complete destruction of the kidney.

URETER

Function. Trattner presents a new instrument, the hydrophorograph, or water nerve recorder, for recording the physiological function of the upper urinary tract in graph form and reports a large number of experiments on human and dog ureters, showing normal peristalsis, antiperistalsis, spasm of the ureter, the amplitude, rate, and rhythm of contraction of the ureter and the reaction of the ureter to various types of stimuli. Experiments have demonstrated four pressure levels at which marked changes in ureteral contraction occur: (1) a pressure level between 0 and 12 cm. of water at which contractions first appear, (2) a pressure level varying from 3 to 18 cm. of water at which contractions are best, (3) the crucial level, above which any increase in pressure causes a marked reduction in the amplitude of contractions, and (4) a pressure level between 38 and 70 cm. of water, at which the contractions disappear. The motor power of the ureter is tested by injecting from 3 to 10 c.cm. of normal saline solution

into the upper ureter and renal pelvis and recording the ureteral response. This response is designated as very strong, moderate feeble, or absent. The test is of value in determining the presence of mechanical obstruction and the effect on the ureter of toxins and inflammation. It therefore aids in the determination of the indications for transplantation of the ureter. Active peristalsis to keep up the normal flow of the urine is an important factor in the prevention of ascending infection.

Constantinesco states that the ureter fulfills two distinct functions: (1) an excretory function in association with the renal pelvis and calyces, and (2) an automatic function which is not evident in its normal state but comes into play in pathological conditions. In the examination of the ureter before ureterography, ureteropyeloscopy should be employed. This is indicated particularly in stenosis, dilatation, diverticulum, and vesico-ureteral regurgitation, and after suture or nephrectomy. From the intensity of the motor reaction conclusions may be drawn with regard to the prognosis. If the spasms are not reflected to the kidney and the cause is removable, the prognosis is good. Atony is an indication of a poor prognosis. In cases with spasm or good contractibility of the ureter, conservative local treatment which will remove or alleviate the cause is indicated, whereas in cases of atony conservative treatment is indicated only in the early stages. Well-established atony with dilatation always necessitates sacrifice of the kidney and ureter.

From experiments on dogs carried out to determine the effects of extract of the posterior lobe of the pituitary gland on the motility of the ureter, Gucci concluded that the use of such an extract impedes rather than aids in the expulsion of a calculus from the ureter as peristalsis stops at the level of the foreign body and begins again below it. He believes that extract of the posterior lobe of the pituitary gland should be employed only with extreme caution.

In studies of the filling conditions of the ureters in animals after the injection of indigocarmine, Fuchs found that the ureters were filled to a greater extent when the bladder was full than when it was empty. Similar findings were made in man by intravenous pyelography. For clinical cases of dilatation of the upper urinary tract, Fuchs therefore advocates drainage of the bladder.

Vitale reports experiments on dogs which he carried out to determine the absorptive capacity of the ureters. Bilateral ureterotomy was done and the kidney removed from one side, the ureter being left as a blind sac with an opening to the

outside. In some of the dogs the epithelium of the ureter was damaged by the injection of a few cubic centimeters of 1 per cent sublimate of mercury. Indigocarmine was injected into the blind ureter and urine specimens were collected from the other side. It was found that while a ureter with normal epithelium possesses a certain capacity to absorb colored substances, a ureter with a damaged epithelium has a greater and more constant power of absorption.

Granuloma. Harner Merts, and Wishard report a case of granuloma of the ureter. The symptoms were not definite and the diagnosis was difficult. Because of the great loss of blood and the roentgenological picture of tumor nephrectomy and ureterectomy were performed. The diagnosis was made from the specimen. As this case presented bleeding from the other side, the question of bilateral involvement in all cases was raised.

Transplantation. Ormond's attention was attracted to the cecum as a site for transplantation of the ureter because of the death of a patient within three months after an operation in which it was necessary to implant the ureters into the cecum because the sigmoid was involved by a tumor. From experiments on four monkeys in which he implanted the right ureter into the cecum and later removed the left kidney Ormond concluded that such an operation is a useful procedure as the products normally excreted by the urine are re-absorbed by the cecum into the blood stream and cause uremia.

Lexner found that when the ureter is transplanted into the skin the postoperative mortality is only one-half as great as that occurring when the transplantation is done into the bowel. Renal function is improved and the ease of irrigation aids in the prevention of complications.

Vesico-ureteral reflux. Scandura states that vesico-ureteral reflux has been recognized for many years in experimental and clinical studies. Cystourogenography frequently reveals its occurrence in cases in which it is unsuspected. The congenital form is less common than is suggested by statistics. It often manifests itself after infection or trauma, and may be associated with malformations such as hypospadias and epina bifida occulta. Frequently absence of changes around the meatus is noted with contraction of the ureter. If the dilatation is pronounced or disproportionate to the age of the patient and other causes are absent, the reflux must be considered congenital. The prognosis is always grave especially when the condition is bilateral.

Accidental reflux may occur in a healthy ureter. The main causes of acquired reflux are (1) vesicu-

lar contraction, (2) changes of the ureteral meatus, and (3) ureteral atony.

Dusso showed that, on entering the bladder wall the ureter does not lose its identity but remains a distinct structure although its mucosa is continuous with that of the bladder at the orifice. The ureter meets the bladder at an angle and passes through the wall, ending as though cut obliquely with a short anterior wall and a longer posterior wall. Its posterior wall continues uninterruptedly with the bladder mucosa, and its superior wall encircles the orifice. The musculature of the ureters is closely connected with that of the vesicular trigone. A true sphincter formation is not revealed in all cases.

The mechanical factors that impede the reflux of fluid into the ureters are (1) the angle of the intraparietal portion of the ureter; (2) the vesicular musculature and fibers that are interlaced with the posterior ureteral wall in its intraparietal arch assuring firm closure of the ureter; (3) strata of longitudinal muscle in the intraparietal portion of the ureter the contraction of which causes closing like that of a valve; (4) the ureteral orifice; (5) the angle of from 90 to 135 degrees at which the ureter penetrates the wall of the bladder; and (6) the ureteral valve, which closes more tightly as the vesicular pressure is increased.

The tunica muscularis of the ureter has three strata, and the ureteral wall is re-enforced by fibers of the detrusor urinae. Guyon, Courtade and Stoppato were able to induce reflux merely by resecting these fibers. The ureter is a passive conductor of urine and an active organ that carries renal secretion to the bladder by rhythmic peristaltic contractions. Increased intravesicular pressure causes a decrease in the energy of the ureteral contractions. The peristaltic waves are usually greatest in the upper third of the ureter and smallest in the lower third.

In tuberculosis of the kidneys vesico-ureteral reflux can be found at all stages, but is most common when the kidneys have produced changes in the ureteral orifices and in the intramural portion of the ureter. Under the latter circumstances it is incurable. Vesico-ureteral reflux may occur also in secondary tuberculous cystitis and may be the factor responsible for infection of the other kidney. It has been observed with vesicular calculi and pyelonephritis, and after traumatic lesions of the ureter. Leguen and Papin believed that it might be caused by nervous diseases, with weakness of the ureteral orifices such as occurs in acute myelitis. A case of tabetic origin was cured after twelve months of antileptic treatment and catheterization. Gayet attributes vesico-

ureteral reflux to an inhibition or paralysis of innervated musculature of the ureteral sphincter. In some cases the cause may be a lesion of the central nervous system and the peripheral nerves. Tandler and Zuckerkandl showed that in prostatic hypertrophy grave chronic retention without infection may produce reflux. Vesicular tumors infiltrating the bladder wall may cause reflux by producing lesions which reduce the capacity and muscular contraction of the bladder and destroy or change the detrusor urinae. When the ureter ends in a diverticulum, vesico-ureteral reflux always occurs. During pregnancy the possibility of infection increases, but the reflux is temporary and ends with parturition.

The symptoms of vesico-ureteral reflux vary. Often, the reflux is asymptomatic, but usually it is associated with lumbar pain and vesicular symptoms. Cystoscopic examinations are not definitely diagnostic. The most certain diagnostic aid is the cystoröntgenogram. Vesico-ureteral reflux can be demonstrated by filling the bladder with indigocarmine solution and then irrigating with clear water. Reflux is present if the bluish discoloration of the urine persists. Experiments have shown that reflux from the bladder into normal ureters under the action of general anesthesia induced with ether or chloroform is impossible. Atony may exist without reflux if the function of the meatus remains good.

Micturition. Cloake states that normal micturition includes a filling and an emptying phase. In the former, the bladder distends and accommodates itself, the distention progressing until the pressure reaches 18 cm. of water. At this pressure there begin rhythmic contractions during which the pressure is raised. Afferent impulses through the sacral autonomic (parasympathetic) fibers reach and pass upward through the central nervous system to the brain where they result in a consciousness of bladder fullness and a desire to micturate. In adults, this desire is under the control of the higher centers, whereas in babies the rise in pressure initiates a parasympathetic reflex which relaxes the internal sphincter and increases the contraction of the detrusor muscle. Voluntary micturition is possible even when no sensation of fullness is present. Increased intra-abdominal pressure is not essential. All that is necessary is the proper environmental setting and volition. Under normal conditions, micturition in man after the age of two or three years is voluntary. After that age the lower centers never act spontaneously. When the significance of this fact is fully realized it may help to an understanding of the vagaries of bladder disorders. Volun-

tary cessation of micturition is a willed action effected probably through the external sphincter.

Chief among the nervous lesions exerting an influence on micturition are disease and injuries of the spinal cord. In severe injuries, the bladder is paralyzed and retention results with overflow incontinence. The bladder then gradually recovers its tone. After a further period there is reflex relaxation of the sphincter and reflex urination gradually increases.

According to the theory of automaticity of bladder action, a closed internal sphincter is possible in the absence of nervous control from the spinal cord and there is an intrinsic mechanism which can relax the sphincter when the bladder is sufficiently distended. The inherent tonus is believed to depend upon a parasympathetic reflex. If this theory is correct, the reflex must be entirely outside the central nervous system.

The same disease involving the same site will vary in its effects upon the bladder functions according to its severity. When the crossed pyramidal tracts are affected in disease of the spinal cord voluntary control over micturition is frequently disordered. The earliest symptoms are defective power of inhibiting reflex micturition. If the sensory ascending paths in the cord are damaged appreciation of bladder fullness is imperfect or absent. Reflex micturition is then likely to occur with brief or no warning and may be wholly unconscious.

When the sacral segments, the site of an important co-ordinating center are diseased, retention of urine commonly results. In some cases micturition is possible but is weak or jerky, of the type associated with the so-called stammering bladder. If the sensory or motor connections between the bladder and sacral cord are damaged, the remaining fibers prevent the establishment of automatic bladder function. Although some sensation persists when only the sympathetic vesicle nerve supply remains, there is no doubt that bladder sensation is conducted mainly by the parasympathetics.

In cases of tumor of the cauda equina which does not involve the conus bladder disturbances are often absent or develop late. When the conus is involved, bladder symptoms appear early or suddenly.

Learnmonth discusses the sympathetic nerves to the bladder from an anatomical viewpoint. The greatest number of sympathetic fibers reach the bladder through the presacral nerve which is situated in front of the bifurcation of the aorta beneath the peritoneum and has two lateral and one medial root. This nerve may be made up of a

comparatively solid strand or of a loose network. At the level of the first sacral vertebra it divides into the two hypogastric nerves which join the hypogastric ganglia. Parasympathetic fibers also join these ganglia. The extrinsic nerves to the bladder leave the ganglia in five or six strands which supply not only the bladder but also the ureters, prostate gland, seminal vesicles, and posterior urethra.

With regard to the presence of inhibitory fibers, Learmonth reports that he has been unable to cause definite dilatation of the bladder by faradic stimulation of its sympathetic nerves. The most convincing evidence of the presence of inhibitory fibers has been clinical. He demonstrated the presence of pain fibers at operation by grasping the presacral nerve in a forceps, this procedure producing a "crushing pain in the bladder." With regard to the presence of motor fibers to the internal sphincter he states that, in man, faradic stimulation of the presacral nerve produces strong contraction of the sphincter. In studies made to determine whether there are motor fibers to the muscle at the ureterovesical orifice he found that stimulation of the presacral nerve caused contraction of both ureterovesical orifices to pinpoint size. He attributed this contraction to the response of the trigone. In investigations regarding the presence of motor fibers to the trigonal muscle he found that stimulation of the presacral nerve caused contraction of the trigonal area of the bladder and that after sympathetic neurectomy the trigone, at least in the male, becomes flaccid and atonic.

Learmonth found also that after sympathetic neurectomy on persons with a normally innervated bladder the internal sphincter is at first dilated, but in the course of two or three weeks recovers sufficient tone to close more or less completely. Frequency is not uncommon for a few days, but at the end of that time micturition becomes normal. In the female, division of the pudic nerves causes no disturbance of micturition and does not prevent conception or normal pregnancy or delivery. Occasionally the operation is followed immediately by menstruation. In the male, ejaculation does not occur although there is no difficulty in the performance of the sex act and a psychical orgasm is experienced.

According to Bailey Learmonth proved that the parasympathetic nerves of the bladder arising from the second, third and fourth sacral nerves are the motor or emptying nerves of the bladder. The sympathetic nerves which lie in the presacral nerve are the antagonists of the parasympathetics and hence the "filling" nerves of the blad-

der. In cases of urinary retention due to nervous disorders, section of the presacral nerve will overcome the antagonism to the motor nerves and allow the contents of the bladder to be expelled. Bailey cites a case in which the operation had good results.

URETHRA

Rupture. Haines urges conservative treatment of traumatic rupture of the urethra, especially when the surgeon has not had much experience with such lesions. He believes that end-to-end anastomosis is not always necessary as frequently the defect will become repaired spontaneously. Pezzar catheters used as suprapubic drains do not drain the bladder adequately. Haines establishes suprapubic drainage with rectal tubes of size 30 to 34 F.

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ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Juvara, K. The Technique of Cranioplasty. Reconstruction of the Cranial Wall With Bone Grafts Cut With the Saw from the Inner Surface of the Tibia (Procédé de cranioplastie. Reconstruction de la paroi crânienne par des greffes minces lames osseuses découpées à la scie de la corticale interne du tibia). *Rev de chir*. Par 1933 III, 40

Defects of the cranium may be closed with inert metal (preferably gold) grafts of dead tissue, and grafts of living tissue (heterografts and autografts). Autografts are the most successful.

Autografts may be obtained from neighboring areas of the skull, the ribs, or the tibia. Grafting from adjacent areas of the skull may be done by means of pedicled osteoperiosteal grafts, pedicled cutaneous grafts, or flaps of bone turned back upon the defect. However these procedures are possible only when the defect is small.

In the use of rib grafts it is best to place the periosteal side down in order to present a smooth surface to the dura. If the defect is too wide for one rib two ribs may be placed side by side.

The best source of grafts is the tibia. The steps in the technique used by the author in the transplantation of tibial grafts are as follows:

1. The edges of the defect are freshened, straightened, and made to assume some regular geometrical shape.
2. The edges are beveled inward.
3. The measurements of the defect are marked out on the upper inner surface of the tibia.
4. The graft is cut to a depth of from 1 1/4 to 2 mm.
5. Its undersurface is smoothed with a rasp and its edges are beveled. The undersurface is then curved either with a special instrument or by making parallel saw cuts, in order to make it fit the curve of the skull.
6. The graft is attached to the edges of the defect by sutures from its overlying periosteum or by suture holes bored through it.

Relatively large defects of the skull may be closed with tibial grafts. JONES W. EMMET, M.D.

EYE

Peter, L. G.: The Treatment of Non Paralytic Squint. *Am J Ophth* 1933 xvi, 45

The treatment of non-paralytic squint should be begun as soon as the diagnosis is made. In monocular esotropia there is a defective fusion faculty with high hyperopic refractive errors which are usually

unequal in the two eyes. Hereditary influences are a factor in the development of the condition. A perfect cure may be prevented by (1) total absence of the fusion faculty and (2) central amblyopia found in the squinting eye. All types of treatment yield the best results before the age of six. It is disastrous to delay treatment until the child is of school age.

The first and most important step in the treatment is refraction. Full correction should be prescribed at the earliest possible moment. Throughout the period of treatment and after the condition has been cured the patient should be examined at least once a year. A full correction, but not an over correction should be worn. In the cases of children about two years of age the maximum correction obtainable by glasses will be effected within a month. Little improvement can be expected beyond that noted at the end of from four to six weeks. In most instances refraction must be supplemented by other measures. Glasses tend to lessen the danger of amblyopia. Causes of failure of glasses alone to lessen the angle of squint are (1) too wide deviation, (2) the presence, after the squint becomes fixed, of organic and molecular changes in the contracted intermus and in the relaxed and stretched externus together with its capsule and covering conjunctiva (3) amblyopia and (4) poor fusion faculty. In squint of low degree (from 15 to 18 degrees) the visual axes become parallel if central vision is good or can be made good in the two eyes and fusion is not weak.

Amblyopia is a phase of monocular squint which is less understood and probably more important from the standpoint of cure of the squint than any other symptom. It does not occur in true alternating squint. In all cases of monocular strabismus in which central vision in the squinting eye is lowered a small central relative scotoma can be outlined. In children up to five or six years of age the deviation and central scotoma can be transferred from one eye to the other by occlusion of the fixing eye. The younger the child the easier it is to transfer the squint and the lowered vision. Amblyopia rarely develops after the seventh year. If no effort is made to correct amblyopia in early childhood the condition becomes permanent. The methods used to prevent and correct amblyopia are:

1. The introduction of atropin into the fixing eye and the use of an occlusive bandage. Before the development of amblyopia, a two-hour session with the bandage daily is sufficient. After its development, the use of the bandage for from three to six hours daily is advisable.

3. Accommodation at the near point. This should be begun as early as possible.

As probably 50 per cent of cases come to operation largely because of inadequate training before the fifth year there are four reasons why surgery should be done:

1. Refraction and amblyopic training will yield maximum results in from one to six months.

2. In young children an advancement and recession suture usually reduce the deviation to an angle which fusion is able to bridge over. In older children and in adults, 35 degrees of squint usually call for a later operation on the fixing eye.

3. Strenuous efforts are necessary to prevent amblyopia up to the seventh year so long as squint exists.

4. Surgical treatment given at an early age brings about single binocular vision before school years begin.

Operation may be postponed because of (1) protest of the parents (2) the state of the child's health (3) the hope that the eyes will eventually become straight and (4) the danger that the eyes may become esophoric and eventually exotropic if the squint is corrected too early by operation. This does not occur if the surgical technique is accurate and fusion is trained.

Uncontrolled tenotomies have been replaced by some form of recession suture. However the majority of surgeons believe it is better to shorten the weak external rectus because of the danger of weak convergence after a recession operation. The shortening operations are (1) recession (2) advancement (3) tucking and (4) the O'Connor cinch operation. In squint from 12 to 15 degrees recession is best. Worth's technique is probably most satisfactory cosmetically. In squint of more than 15 degrees advancement is best. Deviations beyond 20 degrees and sometimes deviations even less than that require a supplementary procedure, either double advancement at separate sessions or advancement at one session and a recession suture on the opposing in terms at another session. If two operations are needed and amblyopia is absent or can be corrected double advancements are better than an advancement and recession. The value of tucking is debatable. This procedure should be used in phorias and only in squint of low degree (7 or 8 degrees). Squint of 10 or more degrees requires recession. The O'Connor cinch operation compares favorably with advancement and recession as regards results but is followed by slow convalescence and a severe reaction. In a wide deviation (from 35 to 40 degrees) advancement and recession on the squinting eye should be followed by the necessary supplementary procedures on the fixing eye carried out about two weeks later.

In most cases even low degrees of deviation should be corrected by tucking by recession, or by a cinch operation because as the child grows older an esophoria of 7 or 8 degrees will probably cause symptoms. There is no rule of linear measure which will

yield the same degree of correction in all cases. Hence millimeter measures cannot replace good surgical judgment in operative procedures. Fusion training may be substituted after operative treatment, but the technique is very much simplified. The atereoscope replaces the amblyoscope. It completes the cure and stabilizes single binocular vision. If a small degree of squint persists, fusion may be aided by prisms.

It is important to know as early as possible whether or not fusion is totally absent or merely defective. Total absence of fusion is found only in true alternating squint and defective fusion in monolateral esotropia.

In alternating esotropia careful refraction is necessary. As fusion is totally absent fusion training need not be practiced. Amblyopia does not occur. The condition can be corrected only by surgery. The operation should be done in the third year of age. Diplopia need never be feared.

Divergent squint is almost always alternating in type. Because of the age at which this type of squint occurs amblyopia is rare. Fusion is usually present. The deformity is less conspicuous than in esotropia. As a rule surgery is necessary for cure. Refraction is necessary and fusion training desirable. Operations on the internus are somewhat difficult. As the tendon is attached close to the limbus manipulations are hindered by the cramped space. Recession of the external rectus is easy but of very little value. The operations used in esotropia are 40 per cent less efficient in divergent squint. Overcorrection need not be feared. The O'Connor cinch operation is especially adapted to the internal rectus muscle because of its positive shortening action and its adaptability to the limited operative field. It is the most positive of all shortening operations.

LESLIE L. MCCOY, M.D.

EAR

Rodger T. R., Friel A. R., Layton T. B., Dundas Grant Sir J. and Others: A Discussion on the Treatment of Chronic Suppurative Otitis. *Proc Roy Soc Med Lond.* 1933 xxvi, 1107.

RODGER stated that of the different methods of non-operative treatment of chronic suppurative otitis he prefers the dry treatment after thorough preliminary cleansing. In the procedure he recommends the ear is first syringed in order to clean the meatus. The middle ear is then thoroughly irrigated with a Hartmann cannula being insinuated into the perforation or against it. When the return flow has become clear the ear is mopped quite dry. While the surgeon holds a final mop in readiness to catch the moist bubbles the patient is then made to inflate the ear by Valsalva's method until the escaping air has a dry sound. When the ear has been thus thoroughly cleansed and dried the inner part of the meatus is filled with fine boracic powder blown in with an insufflator. In some cases it may be necessary first to remove small granulations or polyp. In such cases

the prognosis is less favorable. A search should be made also for nasal or nasopharyngeal conditions which might militate against a successful result and, if found, these should be rectified. In quite a fair proportion of cases the ear remains dry after the first treatment. It appears that in such cases inspissated material has been lodging behind the lip of the perforation and acting as a foreign body. The patient is instructed to return for a repetition of the treatment whenever the powder becomes moist. It is wise to give him an appointment for two weeks later as there may be moisture without his being aware of it. A large perforation may fall to heal, but if the ear remains dry for a considerable period, it may be assumed that the suppuration is confined to the middle ear and any recurrence may be treated with confidence in similar fashion.

FRANK said that the factor which is responsible for persistence of the suppuration and is common to all cases is infection of the exudate or secretion by micro-organisms.

LARSON disagreed with the view that the body a method of relieving intratympanic pressure is sloughing of a part of the membrane. He stated that this may occur occasionally but as a rule the perforation which occurs spontaneously is very small and there is no sloughing. The enlargement of the perforation is due to ulceration around the edge of the opening. The most important part of the treatment is cleansing of the meatus before the drumhead ruptures in the acute stage. This is also one of the most important preliminaries to paracentesis.

DUNDAS-GRANT said that in his opinion the difference between the posterosuperior (marginal) and the antero-inferior perforation has not been sufficiently emphasized. The antero-inferior perforation is comparatively benign. It is a manifestation of a condition in which the discharge comes from the upper part of the eustachian tube. Recovery sometimes follows eustachian medication. In a case of extensive perforation in which a radical mastoid operation was about to be performed, Dundas-Grant stopped the discharge by injecting a solution of chloride of zinc into the eustachian tube. This may be done through a eustachian catheter with or without a Weber-Liel tube. In a very severe case cited the mucus in the tympanum was so inspissated that it was almost a foreign body and after it had been removed by syringing and suction it recurred again and again until forcible irrigation with a solution of sodium bicarbonate through the eustachian tube became necessary. This can be carried out safely only when the perforation is large.

GUMPERT discussed suppurative otitis media in relation to the army and hospitals for children. He stated that, in the army, this condition is one of the most common causes of the rejection of recruits and of the invaliding of soldiers from service. He saw all doubtful ear conditions in recruits in Scotland and did not hesitate to reject recruits who were suffering from chronic suppurative otitis and even those who had a dry perforation. While consideration is

due the soldier who has served for some years, provided the ear condition is not a constant source of trouble, the radical mastoid operation will not render him really fit for army service. With regard to cases of suppurative otitis in hospitals for children, Guthrie reviewed the results in 345 traced cases which had been treated at least two years previously. Among the chronic cases there was only 1 with an intracranial complication, that of a boy aged nine years who had a cerebral abscess. Of the acute cases, intracranial complications occurred in from 3 to 4 per cent. Of the chronic cases, 60 per cent were cured, the ear being dry and deafness only slight. Five of the patients died (3 from pneumonia and 2 from probably otitic meningitis).

BROWN urged earlier mastoid operation in cases of chronic suppurative otitis. He agreed that as a rule the ordinary Schwartz operation is sufficient. In selected cases of long-continued suppuration he performs the transmastoid atticotomy introduced by Heath thirty years ago and subsequently modified. He regards this as a rational method of inspecting the middle-ear contents in every case. It is also a conservative method as the membranous wall of the meatus is kept intact and the other anatomical details and hearing are preserved as much as possible.

ADAM said that for many years he has used the galvanic current in the radical operation for occlusion of the eustachian tube. He suggested that one cause of the frequency of suppuration of the ear in bottle-fed infants may be the practice of turning the infant on its back. A record kept at his request by Kerr showed that of 175 bottle-fed infants in a group of 300 infants, 7 had discharging ears, whereas of the 33 infants which were breast fed, none had discharging ears.

JYVON called attention to the importance of explaining the possibilities for cure of suppurative otitis to the laity. JAMES C. BRADWELL, M.D.

MOUTH

Cade, S.: Radiation Treatment of Cancer of the Mouth and Pharynx. *Lancet*, 1933, CLXXX, 4.

In the treatment of cancer of the mouth and pharynx irradiation is not a method opposed to older established surgical procedures, but the chief modern treatment. Some of the failures of radium therapy should be blamed on the operator rather than on the agent. Until the clinician can define dosage in units of irradiation energy delivered within the tumor the term "radio-sensitivity" can be an expression of only comparative value.

Carcinoma have been classified according to radio-sensitivity into 3 main groups: squamous-celled carcinoma with cell nests, transitional carcinomas without nests, and lymphosarcoma. However, the author concludes from his experience that histologically similar tumors present wide differences in their response to irradiation, and that the response is influenced by the condition of the stroma, the

anatomical situation and lymph and blood supply of the tumor sepsis, and anemia. Therefore the choice of treatment depends upon (1) the site and extent of the disease, (2) the type of the lesion (3) the general condition of the tumor bed, and (4) the general condition of the patient.

In early cases of cancer of the anterior portion of the tongue there is little difference between the results of local excision and irradiation. Of the cases reviewed by Lane Claypon in 1930 operation was followed by three-year survival in from 30 to 25 per cent, and radium treatment by three year survival in 37.8 per cent. In Berven's cases more modern methods increased the incidence of three year survival to 59.1 per cent.

In cancer of the posterior part of the tongue irradiation is the treatment of choice because the lesion cannot be excised without grave risk the degree of malignancy is high, and dissemination occurs early and is widespread. The results from irradiation are good.

In lesions of the palate, buccal mucosa, and floor of the mouth irradiation can be carried out with comparative ease and its results are as good as those of surgery in operable cases and better than those of surgery in inoperable cases.

The author reports a case of epithelioma of the buccal mucosa near the angle of the mouth which was treated by 1,500 mgm.-hrs. of irradiation by interstitial irradiation for seven days with 8 needles containing 0.6 mgm. of radium element each and a surface application with a wax collar for a period of three days. The patient remained well at the end of five years.

Also reported is a case of inoperable epithelioma of the right cheek in which 1,680 mgm. hrs. of irradiation were administered to the buccal mucosa in a period of seven days by means of 10 needles containing 0.6 mgm. of radium element each and 4 needles containing 1 mgm. of radium element each and immediately thereafter 4,704 mgm. hrs. of irradiation were administered to the cheek in a period of seven days by means of 10 needles containing 1 mgm. of radium element each and 9 needles containing 1 mgm. of radium element each. The patient was well two years later.

The great difficulty in the treatment of mouth lesions is the prevention of cervical metastases. It is therefore imperative that the cervical region be treated in every case, even if the neck is entirely normal. The routine employed by the author for neck lesions is as follows:

1. If no glands are palpable, surface irradiation is employed.
2. If glands are palpable but operable, block dissection is done. If removal of the glands is not advisable, open or closed needling is done.
3. If the glands are inoperable, they are given primary deep therapy followed by needling or surface radium irradiation.

In lesions of the oropharynx, irradiation is unquestionably the treatment of choice. Tonsillar tumors

are highly malignant, but when adequately irradiated they disappear in 90 per cent of cases.

The author reports a case of epithelioma of the left tonsil and both pillars which was treated with 16 radon seeds of 1 x mc. each filtered with 0.5 mm. of platinum. Complete regression of the tumor occurred, and two months later dissection of the left side of the neck was done. The patient was well at the end of five years.

Cade reports also a case of extensive epithelioma of the right tonsillar fossa the lateral wall of the pharynx and the tongue which was treated for seven days by interstitial irradiation with 7 needles containing 1 mgm. of radium element each and screened with 0.8 mm. of platinum 1,076 mgm. hrs. of irradiation being given. Three weeks later the cervical glands were excised and 3,652 mgm. hrs. of irradiation were given by implanting in the wound for seven days 7 needles containing 1 mgm. of radium element each. Six weeks later a full course of deep X ray therapy was given. The patient was well after two years and three months.

Lesions of the hypopharynx are very inaccessible to the surgeon. Trotter gains access for needling by performing a lateral transthyroid pharyngotomy. A large group of hypopharyngeal lesions are amenable only to irradiation treatment.

The author reports a case of carcinoma of the lateral pharyngeal wall with extension to the epiglottitis in which a lateral pharyngotomy was done to gain access to the lesion and 15 mgm. of radium in 8 needles were introduced for seven days, and two months later surface irradiation was given by means of a Columbia paste collar. The patient was well at the end of five years.

In carcinoma and sarcoma of the maxillary antrum surgical treatment yields only a small percentage of five year cures, whereas irradiation gives gratifying results. In sarcoma the use of high voltage X rays alone is the method of choice. In carcinoma, roentgen-ray treatment must be followed by radium irradiation.

In a case of round-celled sarcoma treated with a full course of high-voltage X ray irradiation the patient was well at the end of two years. In another case of sarcoma, a full course of X ray treatment was followed by disappearance of all external deformity but a recurrence developed in six months. The recurrence also responded to treatment, but death resulted from widespread metastases. In a case of spindle-celled sarcoma treated with high voltage X ray irradiation the patient remained well at the end of a year. Radium is also of value in these cases. In a fourth case of sarcoma reported by the author, external irradiation was given with a 1-gm. radium unit and 7 needles containing 2 mgm. of radium element each were introduced. This treatment was followed by improvement, but death occurred seven months later from intracranial extension.

In the surgical approach to the antrum the route of choice is through the palate. This route is of value

to provide access for irradiation with radium, for drainage and to provide a permanent inspection window. All of the lesion should be removed with the diathermy loop special attention being paid to ethmoidal and sphenoidal areas. The irradiation is carried out in 3 stages. In the first stage the lesion is irradiated for twenty four hours with from 30 to 40 mgm. of radium in 10-mgm. tubes filtered with 1 mm. of platinum. Ten days later a plaster cast of the cavity and a hollow model consisting of 3 separate layers of shellac are constructed and radium in small needles is sealed between the 3 models. In the second stage of the irradiation the apparatus is applied in 3 halves for convenience, and is worn by the patient ten hours a day or more in periods of two hours until the cavity is covered with a thin fibrous layer.

The author reports a case of endothelioma in which the mass was removed by diathermy 3,480 mgm. hrs. of irradiation were given over a period of ninety-six hours by the use of 4 tubes containing 10 mgm. of radium each, and 1,497 mgm.-hrs. of irradiation were given by the application, for twenty four hours daily for thirteen days, of a shellac plate carrying 4.8 mgm. of radium. The total dosage was 5,337 mgm.-hrs. The patient was well at the end of four years.

In lesions of the pharynx, successful radium therapy is dependent upon favorable access. The author describes an operation of access which permits the insertion of radium needles directly under the lesion.

In a case of squamous-celled carcinoma of the epiglottis reported by Cade, one-third of the full dose of X-ray therapy was administered and, after an operation of access, 1,100 mgm. hrs. of irradiation were given by the insertion along the side of the pharynx for five days of 18 mgm. of radium in long needles. The patient was well at the end of one year and six months.

In carcinoma greater action is often obtained by combining X-ray and radium irradiation, chiefly because a greater tissue dosage can be given than by the use of either the X-rays or radium alone and different wave lengths seem to increase the radiosensitivity of the tumor. This is evident from the dramatic results obtained in tumors which fail to respond to X-ray or radium irradiation alone. The time relation between the 2 types of irradiation is important. The shorter the interval the greater the sensitivity.

In the radium treatment of tumors of the maxilla the author favors uniform irradiation with uniform intensity. Hence he prefers radium to radon and uses maximum filtration.

Cade reports a case of carcinoma of the tongue operated upon eight years previously in which a recurrence the size of an orange developed. Irradiation treatment consisted in the administration of 16,088 mgm. hrs. of irradiation by interstitial irradiation for nine days with 78 mgm. of radium in 36 needles filtered by 0.8 mm. of platinum. The pa-

tient was well and free from bone necrosis for one and one-half years. A second recurrence yielded to treatment for twelve months, but at the end of that time widespread necrosis took place.

Interstitial irradiation must cover a wide area. For surface irradiation by means of collars the radium-skin distance is 15 mm. and from 40 to 60 mgm. of radium are employed for from two to three weeks. However the author irradiated from fourteen to eighteen hours daily with alternate periods of rest and increased the screenage by applying copper brass, or zinc halfway between the radium and the skin.

Mass irradiation is the greatest advance in the radium therapy of lesions of the mouth and pharynx. It requires large quantities of radium. A reasonable distance from the skin is necessary to prevent burns and at the same time to secure an efficient depth dose. At least 3 gm. of radium should be used 4 or 6 gm. or more are preferable. In the calculation of the dosage the Sievert unit is employed. This is defined as the unit of gamma ray intensity found at a distance of 1 cm. from a radium preparation containing 1 gm. of radium element filtered in all directions through 0.5 mm. of platinum and considered to be a point source. (The text may be in error as Sievert's unit is 1 mgm. at 1 cm. This unit of intensity used for one hour is known as the Grinnet unit of dosage. ABSTRACTOR)

In the treatment of lesions of the tonsil lateral pharyngeal wall, and pyriform fossa, from 3 to 8 portals of entry are employed according to the extent and position of the lesion. The bomb is used with a skin distance of 3 cm. Six applications of one hour each are required to produce an erythema with dry peeling, and seven hours to produce a selective radiodermatitis. Thus, with the 2-gm. bomb at a distance of 3 cm. the erythema dose is 1,200 units. It has been possible to cause complete retrogression of the lesions by this technique but at times there have been severe reactions on account of the short radium distance. The treatments are carried out in from sixteen to eighteen days.

In a case of carcinoma of the pyriform fossa treated with deep X-ray therapy there was complete disappearance of the lesion for two and one-half years. When a recurrence developed in the lateral wall of the pharynx, an operation of access was done and 1,336 mgm.-hrs. of irradiation were given over a period of three days with 18 mgm. of radium. Healing resulted, but the lesion extended forward into the epiglottis. The 2-gm. bomb was then used for treatment at a skin distance of 3.5 cm., 3,840 Grinnet units being given by 2 treatments a day for eighteen days which totalled twenty four hours of irradiation. Complete healing resulted with acute dermatitis.

In a case of carcinoma of the left pyriform fossa, deep X-ray irradiation was followed by improvement, but later active disease developed in the epiglottis. The latter was treated with 2,670 Grinnet units administered with the 2-gm. unit with a

radium-skin distance of 3 cm. and 8 portals of entry. The irradiation was given for two hours daily for a total of thirteen hours on the left side and a total of six hours on the right side. The lesion healed completely.

The author reports also a case of epitheliomatous ulcer of the left pyriform fossa involving the lateral surface of the epiglottis and the cervical glands. Following preliminary X-ray treatment in this case 3,160 Grinmet units were given by irradiation for twenty hours spread over three weeks with the use of the 2-gm. unit, a skin distance of 3 cm., and 8 portals of entry. The lesion healed.

In a case of papillary carcinoma of the tonsil 2,550 Grinmet units of irradiation were given with the 2-gm. unit through 3 portals of entry a total of eighteen hours of irradiation being administered in a period of fifteen days. Complete healing resulted.

In a case of hypopharyngeal squamous-celled carcinoma which had fungated through the skin formed a fistula on the right side of the neck, and completely obstructed the pharynx, pharyngotomy was performed and a total of 4,338 Grinmet units of irradiation were given with extreme care through 4 portals of entry on the right side of the neck. The radium-skin distance was 3 cm. The lesion healed, the fistula closed, the swelling subsided and the patient gained 23 lbs.

If mass irradiation is to be increased in efficiency a greater radium-skin distance must be employed. This necessitates large amounts of radium. Berven is quoted as stating that the treatment of carcinoma of the tonsil by means of the old method resulted in no three year survivals, whereas treatment by the new method is followed by survival in 28.6 per cent of cases representing all stages. In lympho-epithelioma, mass irradiation is followed by survival in 75 per cent of cases.

The author reviews the results of irradiation in 337 cases representing all stages with and without metastases. Thirty-three and one-half per cent of the patients are alive from one to seven years after the treatment. Of those treated for a tongue lesion, thirty-three per cent are alive. The incidence of five-year survival was 28.7 per cent, and the incidence of seven-year survival 11 per cent. In cases of carcinoma of the pyriform fossa there were no survivals.

The author draws the following conclusions:
1. Total disappearance of primary and glandular lesions may be achieved by irradiation.

2. The disappearance of either may be permanent or temporary but its duration is quite impossible to predict.

3. In operable cases, irradiation has reached a status of equality with surgical excision. In inoperable cases it is the only method.

4. Irradiation is a purely local remedy.

5. In hopeless cases, palliation by radium and X-ray irradiation is certainly worth while.

6. A most powerful and promising weapon is the "mass irradiation unit."

7. What we have yet to learn about irradiation is infinitely greater than the little we know.

The article contains photographs, diagrams colored plates and tables. A. JAMES LARKIN M.D.

NECK

Marri P.: The Importance of Enterococci in the Genesis of Suppurative Adenitis of the Neck. A Clinico-bacteriological Study (Importanza degli enterococchi nella genesi degli adenoflemmoni del collo. Studio clinico-batterologico) *Polidina* Rome, 1933 xli, sez. chir. 320

The author reports sixteen cases of phlegmon of the neck. In nine, the phlegmon was in the submaxillary area, and in seven in the carotid area. In three cases cultures yielded the hemolytic staphylococcus pyogenes aureus which was virulent in the rabbit. In the rest, a pure culture of organisms belonging to the group of enterococci was obtained.

Lesions of the type described are inflammatory and secondary to infectious processes draining into the lymphatics of the upper part of the neck. Any of the bacteria usually found in the mouth or pharynx may cause them, but the author believes that enterococci are most often responsible. Bacteriological diagnosis is of great importance in cases in which specific serum therapy or vaccine therapy is indicated. The course of the lesion depends upon the virulence of the causative organism. When the phlegmon is due to bacteria of low virulence cure is brought about promptly by surgical drainage of the suppurating node. EUGENE T. LUNDY M.D.

Lödin M.: Irradiation Treatment of Basedow's Disease (Zur Strahlentherapie der Basedow'schen Krankheit) *Acta radiol.*, 1933 xiv 28

The results of irradiation treatment in Basedow's disease are disputed chiefly by surgeons. The statistics on which objections to irradiation treatment are based are scarcely applicable as they have been collected carelessly the necessary criteria for comparison have not been definitely established and there is a good deal of uncertainty as to what shall be regarded as a cure.

The chief dangers ascribed to irradiation treatment of Basedow's disease are capsular adhesions, necrosis of the larynx and myxoedema. Adhesions do not occur in many cases and are no longer unanimously considered disadvantageous in the event of the necessity for subsequent operation. Necrosis of the larynx and myxoedema occurred in the early days when more intensive dosages were employed but today are not to be feared. The undisputed advantage, in some cases, of the brevity of the period of treatment by surgical methods is frequently nullified by the tendency of many surgeons to give preliminary treatment for a period of weeks or months before the operation. The chief disadvantages of irradiation are the greater frequency of recurrence, which is due to the fact that in this treatment the gland tissue which may tend to recur is not

removed, and the inability of the roentgenologist thus far to demonstrate any characteristic or constant changes in the histological picture of struma ascribable to his method.

With regard to the mortality the author says that all criteria should be equally applicable to both methods. Deaths following irradiation treatment in the cases of patients considered too poor risks for operation occur in spite of rather than because of the irradiation.

JONAS W. BERNHARD M.D.

Blumgart H. L., Riseman, J. E. F., Davis, D., and Berlin, D. D.: The Therapeutic Effect of Total Ablation of Normal Thyroid on Congestive Heart Failure and Angina Pectoris. III. Early Results in Various Types of Cardiovascular Disease and Coincident Pathological States With or Without Clinical or Pathological Evidence of Thyroid Toxicity. *Arch. Int. Med.* 1933 111, 165

Normally the velocity of the blood flow is directly proportional to the metabolic demands of the body and the latter can be accurately determined from the basal metabolic rate. In patients with congestive heart disease the blood velocity is low in spite of the fact that the basal metabolic rate is normal. This disproportion between the rate of flow required by a cardiac with a normal basal metabolism and the slow rate actually present was found to be the index of cardiac decompensation. The authors postulated that if in such an individual the metabolic demands of the body could be decreased, the blood velocity although slow might be adequate to prevent the manifestations of decompensation.

Accordingly ten patients suffering from congestive heart failure and angina pectoris, who had a poor prognosis as regards life but were fair surgical risks, were subjected to total ablation of the thyroid gland. Previously it had been determined by the authors and others that subtotal thyroidectomy was of little or no value. As these patients had suffered for many years and had become progressively worse in spite of medical treatment, they submitted to the operation willingly.

The outstanding results from three to six months after the operation may be summarized as follows:

1. The attacks of angina pectoris which were experienced by two of the patients before operation have not recurred.

2. All patients have shown marked improvement and have been able to undertake from slight to considerable exertion without the development of palpitation, dyspnea or signs of congestive heart failure.

3. The basal metabolic rate of each patient has shown a significant and persistent decrease which has paralleled the most striking improvement.

4. In seven patients the velocity of the blood flow has become even slower a change indicating that under the new postoperative conditions the heart is required to do less work than it was able to accomplish when the metabolic rate was normal.

5. Frequently recurring hemoptysis and pain in the chest have ceased since the operation.

6. Evidences of mild myxedema have developed.

The authors emphasize that because of the uncertainty as to the duration of the beneficial results, the operation should be undertaken only in cases with congestive failure or angina pectoris in which the operative risk is fair and medical procedures have failed to give the desired results. Patients with active coronary disease, active infection, vascular accidents, repeated pulmonary infarctions, or rapidly progressive syphilitic cardiovascular disease are probably unfavorable subjects.

There was one operative death in the eleven cases reviewed and one in a previous series of five cases. Two patients developed evidences of mild parathyroid tetany but this has been controlled by decreasing amounts of calcium chloride and vitamin D.

ARTHUR S. W. TOWNSEND M.D.

Mandl, F.: The Technique of Parathyroidectomy in Osteitis Fibrosa on the Basis of Recent Observations (Zur Technik der Parathyroidektomie bei Ostitis fibrosa auf Grund neuer Beobachtungen). *Deutsche Zeitsch. f. Chir.* 1933 cxvii, 368

The author believes that he was the first to cure von Recklinghausen's disease by removing a parathyroid tumor. Removal of the tumor was followed by a decrease in the calcium content of the blood and urine. Erdheim's theory that removal of the parathyroids is followed by bone changes was therefore confirmed.

Mandl has operated upon fifty-five cases of von Recklinghausen's disease. The indications for operation have been extended. In various diseases in which no parathyroid tumor could be found, Barr and Bulger have removed even normal parathyroids with successful results. Balfin, Leriche, and Jung have treated a series of cases of spondylitis by removal of parathyroid bodies. Lévère and Léri designate bone diseases associated with hypercalcemia by the general term "parathyroid osteosis" and classify them separately from bone diseases associated with hypocalcemia. In Dupuytren's contracture and myotonic dystrophy with cataract, Leriche, Jung, and Brunschwig use substitution therapy. In scleroderma Leriche and Jung remove the parathyroid bodies when hypercalcemia is present.

Mandl reports a case of von Recklinghausen's osteitis fibrosa generalisata in which the parathyroid tumor was located deep beneath the sternum on the right side. Normal parathyroids identified at operation were not disturbed. After the operation the blood calcium decreased markedly and tetany occurred. Under treatment by the administration of calcium and parathyroid extract and regulation of the diet the tetany stopped. Nevertheless, the general condition became worse, the patient grew apathetic, the sensorium became clouded, new fractures occurred in the pelvis, the tetany recurred there was a pustular eruption. Death resulted two and a half months after the operation.

Attention is called to the fact that because of the marked drop in the blood calcium, prophylactic treatment such as the administration of apenill and parathormone was necessary even before the tetany developed. The psychic manifestations were related to the tetany. The position of the parathyroid tumor was atypical. The author believes that in many cases of suspected parathyroid tumor in which no tumor is found at operation the failure to find the tumor may be due to an unusual position of the neoplasm.

Of 55 cases of osteitis fibrosa reported in the literature, the parathyroids were enlarged in forty three. At operation, the tumor was found most often at the site of the left inferior parathyroid. This localization does not agree with the findings at autopsy.

After operation parathormone, paratotal apenill or calcium should be given for three weeks regardless of the calcium determinations. In fifty five cases

cited, living parathyroid tissue in addition to the parathyroid tumor was demonstrated with certainty. Without doubt, in some of the cases in which the operation was followed by death too much parathyroid tissue was removed. We now know definitely that cases of osteitis fibrosa generalisata which are not operated upon are fatal. Operation is therefore essential.

The diagnosis of the disease and particularly its pre-operative differentiation from bone carcinoma, rickets, localized osteitis fibrosa, other forms of osteoporosis and multiple myeloma, remains difficult. Determinations of the calcium content of the blood and urine must be made as operation is successful only when the calcium is increased. Before removal of the parathyroid tumor the presence of normal parathyroid tissue must be established. The operation must be followed by calcium or parathyroid substitution therapy. LORR (2)

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS CRANIAL NERVES

Riggs, H. W.: The Dangers and the Mortality of Ventriculography. *Bull. Neurological Inst. New York*, 1933, III, 2.

At the Neurological Institute of New York there were 12 deaths in a series of 148 ventriculographies for suspected intracranial neoplasm. The investigation herewith reported was undertaken to establish more exact indications for the procedure and find the best methods of treating serious symptoms, and to identify the types of cases in which ventriculography is likely to be dangerous.

On the basis of the symptoms which followed the direct introduction of air into the ventricles the cases are divided into 3 groups: (1) those with mild or no symptoms referable to the procedure; (2) those with dangerous symptoms in which recovery resulted; and (3) those which were fatal. Nearly all of the patients complained of nausea, vomiting and headaches, and showed some rise in the temperature. The dangerous symptom was stupor with or without changes in the respiration, pulse, blood pressure, and temperature. Patients with stupor before the introduction of the air and showing no change after its introduction were classed as having no symptoms referable to the ventriculographic examination. In the 12 fatal cases the main symptom was progressive stupor with a terminal rise in the temperature to 107 or 108 degrees F. One patient developed tonic spasms with a generalized tremor; one presented localized muscular twitchings and other phenomena due to irritation; and 3 developed acute respiratory failure after the onset of the stupor. In some cases the stupor began suddenly and was of short duration, while in others it was gradually progressive. The time of its onset varied from immediately to three days after the operation. Dangerous symptoms developed within ten hours in two-thirds of the patients who recovered and within eight hours in two-thirds of those who died.

Most of the fatalities occurred in cases with advanced symptoms and signs of intracranial tumor. Dangerous symptoms developed particularly often in cases of subcortical growths producing pressure on the ventricle and the brain stem. These symptoms were little affected by caffeine and hypertonic glucose solution given intravenously but were frequently relieved by puncture of the ventricle and release of the air. They were due chiefly to a marked disturbance of the balance of pressure within the cranial cavity but their frequency seemed to have no relation to the degree of ventricular dilatation or the amount of increase of the intracranial pressure.

In conclusion the author says that ventriculo-

graphy is an indispensable diagnostic aid, but should be used only in cases in which localization is very difficult or impossible by clinical means alone. It is particularly dangerous when a supratentorial growth is causing pressure on the third ventricle or the brain stem.

E. S. PLATT, M.D.

Masson, G. B.: The Disturbances in Vision and in Visual Fields After Ventriculography. *Bull. Neurological Inst. New York*, 1933, III, 190.

After the occurrence of temporary blindness in a case in which ventriculography was done at the Neurological Institute of New York, a study was made of the visual fields in a series of 100 consecutive cases to learn how frequently a change in the fields occurred following the intraventricular injection of air and the causes of such changes. In a review of the literature no reference to visual disturbances following ventriculography and encephalography could be found, but it is generally agreed that in the presence of papilledema from increased intracranial pressure the air should be introduced into the ventricles in order to allow its immediate removal after the roentgenograms have been made.

In a series of 500 cases in which encephalography was done there was no instance of temporary blindness although meningeal irritation and transient photophobia were observed. (After this article was written 1 case of blindness was seen.) Of a series of 100 consecutive cases in which ventriculography was done, temporary blindness occurred in 6. These 6 cases are reported in detail.

The method of introducing the air seemed to have no relation to the occurrence of blindness. Three patients who became temporarily blind had normal fundi, and 3 a papilledema of from 2 to 4 diopters. The pressure in the ventricles ranged from 160 to 220 mm. Before the ventriculographic examination, 2 patients had marked reduction of visual acuity but the 5 others had normal or nearly normal vision. Two patients had marked field defects before the examination. In 2 patients the visual disturbances began during the manipulations incident to the procedure, but in the cases of the 4 others the time interval before the beginning of failure of vision was two, three, four and sixteen hours respectively. In all of the patients vision was regained in from twenty-one to seventy-two hours. In 2 cases the light reflex was retained during the period of blindness, while in 1 case the pupils were widely dilated and did not react to light even during the time that some vision remained. All of the patients regained the visual acuity which they possessed before the ventriculographic examination, and 2 of them had greater visual acuity after operation than they had when they were admitted to the hospital.

Three possible causes for the temporary loss of vision are discussed: (1) the nature and situation of the lesion and the changes in the fundi and vision existing before the ventriculographic examination; (2) the introduction of air; and (3) the trauma due to the puncture of the brain. No satisfactory explanation has been discovered, but the first 2 possibilities seem to be ruled out. It seems most probable that the trauma incident to the puncture of the brain was responsible but the mechanism of production of the temporary blindness is not understood.

E. S. PLATT M.D.

Heymann, E. Surgical Interference in Cerebral Gliomata (Ueber chirurgische Eingriffe bei Grosshirngliomen). *Zentralbl. f. Chir.*, 1933 p. 786

The author discusses gliomata of the cerebrum on the basis of the large experience he has gained from 800 operations on the brain. His classification of these tumors is based on external characteristics chiefly the location of the neoplasm as is also the classification which Schwartz suggested following a consideration of the embryological facts. Gliomata of the cerebellum are not included in this classification. The operative prognosis of gliomata of the cerebellum is considerably better than that of cerebral gliomata. The author cites the cases of 2 patients operated upon for cerebellar tumor who have remained well for twenty-two and twelve years respectively.

In his first group Heymann includes the gliomata of senescence which have a poor prognosis as they come sudden terminal crises without warning. In cases of tumor of this type all treatment is in vain even decompressive trephination. Particularly tumors which originate from a circumscribed focus in the region of the ventricle produce a rapidly spreading edema of the brain.

The author next discusses the polar gliomata of which the frontal-pole gliomata have the best prognosis. Unilateral growths have, of course, a more favorable prognosis than bilateral growths, but even the latter may be resected successfully. Gliomata on the temporal and occipital poles have a far less favorable prognosis because they are composed of less differentiated glial elements, originate in the depths and frequently manifest their presence first by severe terminal convulsions with edema of the brain. The author believes that the temporal-pole gliomata have a particularly poor prognosis. However temporal-pole gliomata involving the gyrus temporalis medialis and restricted essentially to that convolution are an exception as they may be resected easily and without a reaction. In cases of tumor of this type the operative prognosis is good but recurrence is rapid and usually causes death. The occipital pole gliomata are easily accessible but extremely malignant. The most rapid recurrences seen by the author were those of tumors of this type.

Heymann's third group are the gyrus gliomata which are limited to a single convolution. This group also tend to recur.

Growths located on the margin of the great nuclei particularly about the optic thalamus, in the lamina terminalis of the infundibulum are not suitable for surgery.

VOGELER (Z)

SPINAL CORD AND ITS COVERINGS

Eleberg, C. A.: Concerning the Clinical Features and the Diagnosis of Extramedullary Meningeal and Perineural Fibroblastomata of the Spinal Cord. *Bull. Neurological Inst. New York* 1933 III, 124

Meningeal fibroblastomata are mesodermal growths which reproduce the structure of psammoma granulations to a varying degree. The gross appearance of the growths is characteristic. The tumors are usually round and well encapsulated and have no tendency to invade the tissues of the central nervous system. The vascularity of the surrounding soft tissues and of the bone is generally increased. Histological examination shows that the cells tend to form whorls and often contain islands of calcification (psammoma bodies). The term meningioma suggested for these tumors by Cushing has been widely adopted. This term is clinically useful but suggests that the growths are derived from the meninges. While some of the neoplasms have the gross appearance of a meningioma their cells are not arranged in the typical manner and only in some areas do they lay down fibrous fibrils and collagen. Sometimes also a considerable number of cells undergoing mitotic division are seen. These variations have given rise to differences of opinion regarding the proper nomenclature and classification of both the intracranial and the spinal growths. The author believes that the apparent tendency of the more malignant meningeal fibroblastomata to recur with great frequency is probably due to incomplete removal of the tumors by the surgeon.

Meningeal fibroblastomata occurring in the vertebral canal are much smaller than the cranial variety and are attached to the inner surface of the dura. They usually lie underneath the arachnoid but in rare instances are found outside the dura. They occur more frequently in females than in males and are most common after the fortieth year of life and in the thoracic part of the vertebral column. Their occurrence in the lumbar region is rare. The patients are usually first seen by the surgeon from one to two years after the onset of the disturbances. Whatever the site of the growth, the symptoms begin relatively often with motor or sensory disturbances in the lower extremities. As a rule the globulin and total protein of the spinal fluid are increased only slightly.

The perineural fibroblastomata occur with equal frequency in males and in females and are as common before as after the fortieth year of age. They are found as often in the cervical and lumbar regions as in the thoracic region. Root pains occur more often and the increase in the globulin and protein content of the spinal fluid below the neoplasm is higher than in cases of meningeal fibroblastomata.

As extramedullary meningeal and extramedullary perineural fibroblastomata have characteristic syndromes a correct pre-operative diagnosis of the pathological nature of the neoplasm is often possible. As in cases of tumor of the brain, the clinician should attempt to diagnose the histological nature of the growth as well as its situation.

ANTHONY F. SAVA, M.D.

PERIPHERAL NERVES

Rabbin, L.: The Time of Restoration of Functional and Working Capacity After the Suture of Nerves of the Upper Extremities (Ueber den Zeitpunkt einer Wiederherstellung der Funktions- und Arbeitsfähigkeit nach der Nervenast an den oberen Extremitäten) *Neu chir Arch* 93: xxvii, 192.

This article is based on 138 cases of suture of nerves of the upper extremities, 53 of which were followed up for a long time.

The regeneration of nerves depends upon several factors. Most important are the anatomopathological peculiarities of the injured nerve, the level and degree of its injury the method of primary treatment, and the time that elapsed between the injury and the operation.

Simple motor nerves, such as the radial nerve, and simple sensory nerves, such as the cutaneous anterior brachial branch of the median and saphenous nerves, show a better power of regeneration than mixed, complicated nerve stems. Among the latter the ulnar and the sciatic nerves have the poorest power of regeneration. Injuries of proximal nerves heal more rapidly than those of distal nerves. Regeneration takes place more quickly after partial division than after complete division of the nerve stem. Various wound complications, especially suppurations, affect regeneration very unfavorably. The earlier surgical treatment (nerve suture) is undertaken, the more quickly are favorable results obtained. Primary suture therefore appears to be best. If primary suture is impossible, suturing should be undertaken from two to three months after healing of the wound.

After suture of the injured nerve stem the pain usually ceases immediately but occasionally it persists for a few weeks. This is true also of vasomotor and trophic disturbances with the exception of anhydrosis and hornification or atrophy of the epidermis, which sometimes persist for many years. From three to six weeks after the operation the first signs of restoration of sensibility appear in the deep tissues. These consist of sensitivity in anesthetic zones, formation on pressure over the peripheral portion of the nerve stem distal to the site of injury and pain on pressure over the muscles lying nearer the site of the nerve injury. About four months after the operation restoration of the so-called "protopathic" (Head) or "affective" (Foerster) sensibility occurs gradually. Thereafter the signs of regeneration on the part of the motor sphere

appear. Simultaneously with the restoration of motor function, about four months after the suture of the nerve, electrical excitability of the nerves and muscles to the faradic current is restored and, finally, from twelve to fourteen months after the operation, distinct sensibility to touch and heat returns.

G. ALDROV (Z)

SYMPATHETIC NERVES

Woodward, H. H., and Norrish, H. E.: The Anatomy of the Peripheral Sympathetic Nervous System. *Brit. J. Surg.* 1933, xii, 83.

Evidence of a general nature has been presented indicating that the sympathetic nervous system is laid down in a way suggesting a particular conformation and a precise anatomy for each region of the body.

From the surgical point of view the sympathetic innervation of any particular region can be determined by macroscopic dissection. Innervating fibers that cannot be determined by this method are of no surgical importance.

Groups of structures with a certain anatomical homogeneity have a common source of supply of sympathetic fibers, and these fibers have a uniform way of reaching their final distribution.

The most constant and valuable result that can be achieved with certainty by surgery of the peripheral sympathetic nervous system is an increase in the blood supply of the denervated member.

In the case of the head, neck, and upper extremity interruption of sympathetic innervation is best achieved by removing the sympathetic chain from the level of the second rib upward as far as the lateral angle between the vertebral and subclavian arteries.

Sympathetic denervation of the large gut within the distribution of the inferior mesenteric artery can be achieved by stripping the adventitia widely from the aorta, beginning above the origin of the vessel, going distal to its origin, and continuing on the vessel itself as far as possible, that is, as far as its first branches. It is desirable also to remove the hypogastric plexus.

In the case of the pelvic viscera, including the ureter sympathetic denervation can be accomplished by removing the hypogastric plexus.

For the lower extremity sympathetic denervation can be done most conveniently by removing the third and fourth lumbar ganglia and the intervening chain.

H. EARLE CORNWELL, M.D.

Gaskell, G. E.: The Surgery of the Sympathetic Nervous System. *Brit. J. Surg.* 1933 xii, 113.

The author reviews the anatomy of the sympathetic nervous system and reports seven cases of Raynaud's disease in which a portion of the thoracic sympathetic chain was removed. He emphasizes the importance of removing the second dorsal ganglion up to and including the stellate ganglion, as sympathetic fibers leaving the second dorsal sympathetic ganglion may communicate with the first

dorsal spinal nerve and if this communication is not interrupted sympathetic impulses may escape from the spinal cord and the beneficial results of the operation may be diminished. He advocates an anterior approach from the root of the neck. In the operation he performs a 3 in. collar incision is made parallel to, and $\frac{1}{4}$ in. above, the clavicle. The dissection is then carried down until the scalenus anticus is exposed. The muscle is divided transversely about $\frac{3}{4}$ in. above its insertion into the scalenus tubercle of the first rib. The subclavian artery is retracted downward and toward the mid line. The dome of the pleura, together with the fascia covering it, is pushed downward until the sides of the body of the first and second dorsal vertebrae are exposed. The sympathetic chain is then visualized and a segment removed. The bilateral approach may be carried out at the same operation.

In conclusion Gask reports three cases of mega colon in which good results were obtained by removal of the hypogastric sympathetics.

ROBERT ZOLLINGER, M.D.

Rieder W: Resection of the Rami Communicantes Supplying the Hand (*Resektion der zur Hand gehenden Rami communicantes*) *Chirurg* 1933, v 819.

Rieder describes the sympathetic innervation of the upper extremity on the basis of his own investigation and shows the sympathetic fibers supplying the hand by means of a schematic drawing. He then describes two operative procedures which he devised to exclude the sympathetic fibers leading to the hand.

The operation may be performed through an incision in the neck or through a paravertebral incision. All of the rami communicantes from the seventh cervical to the third thoracic must be severed. If the operation is performed through the neck the cervical incision is made parallel with the inner edge of the sternocleidomastoid muscle from the level of the hyoid bone to at least $1\frac{1}{4}$ fingerbreadths below the sternoclavicular joint. Skin, platysma, fascia of the neck, and omohyoid muscle are severed. Directly behind the origin of the vertebral artery from the subclavian artery in front of the head of the first rib and therefore in the angle between the eighth cervical and the first thoracic nerve, is the inferior cervical ganglion. When this is found, the sympathetic root is followed downward to find the first and second thoracic ganglia. To accomplish this it is necessary to loosen the dome of the pleura by sectioning the pleurovertebral, pleurocostal, and pleurotracheal

ligaments by which the dome of the pleura is held tense.

After the field has been properly exposed the rami communicantes from the lower cervical and first thoracic ganglia are resected. The rami communicantes arising from them are recognized from their course. If it is impossible to reach the second thoracic ganglion from above, the operation is concluded and the result awaited. If new disturbances arise it is necessary to resect the second and third thoracic ganglia through a paravertebral incision. As the lower cervical ganglion can also be reached easily through a paravertebral incision, resection of the lower cervical as well as the first and second thoracic ganglia can be done through a paravertebral incision at one time. This is perhaps a more formidable operation but especially in severe cases is more effective. Therefore today the author usually resects these fibers through a paravertebral incision.

The patient lies on the side opposite the side to be operated upon. The arm on the side to be operated upon is drawn forward and downward to obtain greater space between the spine and the scapula. The skin incision is made two fingerbreadths from the end of the spinous process. It is begun at the level of the fourth cervical vertebra and carried down to the level of the fifth thoracic vertebra. The muscles are separated longitudinally down to the ribs and retracted laterally. The ends of the fourth, third, second, and first ribs are then resected for a distance of 3 or 4 cm. including the head of the rib and the transverse processes in the same region are removed with a bone forceps. In this way the lateral wall of the vertebrae is exposed. Hemorrhage from the spine is checked with wax. Intercostal nerves and vessels can usually be protected from injury.

The sympathetic cord is usually situated between pleura and intercostal nerves somewhat medially from the head of the rib. The ganglia are surrounded by a fine connective tissue covering and a little fat and give off two or three short rami communicantes to the corresponding intercostal nerves. If the intercostal nerves are followed medially and the pleura is carefully pushed laterally the sympathetic nerve will be seen running between them. If this nerve is difficult to find it is best to search for the rami communicantes leaving the intercostal nerve and follow them to the ganglion. When the ganglia are readily visible, they are drawn forward with a hook and the rami communicantes which are given off are severed or the ganglia are extirpated. The rami communicantes from the lowest cervical ganglion are severed last after this ganglion has been identified. The operation is shown by two drawings. RIEDER (2)

SURGERY OF THE CHEST

TRACHEA, LUNGS, AND PLEURA

Jacobson, H. C.: A Brief Review of Cauterization of Adhesions in the Pneumothorax Treatment of Pulmonary Tuberculosis (Kurze Uebersicht ueber die Strangdurchtrennung bei Pneumothoraxbehandlung der Lungentuberkulose) *Nord. med. Tidsskr.*, 1933 p. 338.

The first cauterization of adhesions was performed in the Silvas Sanitarium in the fall of 1913. Only after 1931 did the method become better known. Today there are more than 100 publications on the subject.

The possibilities of adhesion cauterization on the basis of the roentgen findings are very easily overestimated. The adhesions are more numerous and, in general, larger than they appear in the roentgenogram, and as their entire extent in the pleural dome cannot be shown in the roentgenogram operability cannot be determined from the roentgen findings alone. Adhesions in the lateral regions cause the least difficulty in the roentgen examination and at operation. Thoracoscopy shows the adhesions best and is at the same time a part of the operation.

Surface adhesions are the most difficult to separate. The separation should be done as close to the parietal pleura as possible in order to prevent tearing of the lung tissue. In general, strand-like and membranous adhesions offer no difficulties. Tearing of the lung is the most frequent complication. If tuberculous foci are opened thereby an infection of the pleura occurs and is followed by an exudative pleurisy which runs the usual course. The symptoms gradually disappear and the end result is not affected. The most serious complication is the opening of a cavity. The result is an empyema with a mixed infection and a very unfavorable prognosis.

In one of the tables included in the article the incidence of a serous exudate following the cauterization of adhesions ranges from 3 to 100 per cent. The explanation is simple. Especially in thoracoscopy a light shadow is frequently seen in the costophrenic angle a day or two after the operation. In half of the cases the exudate producing this shadow disappears after one or two weeks without having affected the patient in any way. This temporary exudate is to be regarded only as a thermic pleurisy and therefore as a consequence of the cauterization procedure. The serious results of perforation of cavities during the cauterization of adhesions usually appear a few days after operation. However cases have been observed in which the perforation did not occur until from fifteen to thirty days after the operation. There are also intermediate forms in which tuberculous empyema develops without any mixed infection and without any demonstrable perforation.

The author refers to the monographs of Diehls and Kremer and to the publications and statistics of Unverricht and Maurer
GIESSEN (2).

Rischel, A.: The Operative Treatment of Tuberculosis of the Lungs (Ueber die operative Behandlung der Lungentuberkulose) *Nord. med. Tidsskr.* 1933, p. 337

Partial thoracoplasty on the upper lobes is based on a purely mechanical theory a direct change in the static conditions with the closure of cavities being assumed. Such a thoracoplastic operation which should be called "relaxation therapy" has at first no beneficial influence upon the immunobiological conditions of the body on the contrary an unfavorable influence on these conditions, even if only temporary from the destruction of tissue is to be assumed. To this may be due also postoperative symptoms such as increased activity of the process, activation of hitherto quiescent processes in the other lung, and aggravation of already existing complications such as extrapulmonary tuberculous and affections of the larynx. The operation should be followed by treatment in a sanatorium as rest is of great importance in the spontaneous closure of cavities.

A thoracoplastic operation is indicated when spontaneous healing cannot be expected when pneumothorax has been unsuccessful on account of adhesions or an unfavorable position of the cavities and when phrenico-exeresis has failed to bring about closure of the cavities. Apicolysis with paraffin tamponade should be done only when necessary. Thoracoplasty is contra-indicated by active processes in the other lung and by marked exudative processes in the lung under treatment. It is to be considered chiefly for chronic fibrosing and productive cavernous processes with the tendency toward retraction necessary for the closure of cavities. Other indications and contra indications are cited.

The author performs thoracoplasty under a combined infiltration and nerve-block anesthesia with superficial ether anesthesia. The various steps in the resection of the ribs are described briefly. Among the intra-operative complications are symptoms of collapse, stopping of the respiration, nerve injuries, and accidental pneumothorax. Postoperative complications include heart failure bronchopneumonia from the aspiration of secretions, cropous pneumonia, pulmonary edema, embolism pleurisy and temporary emphysema.

Of 196 patients subjected to thoracoplasty 49 per cent were found to be still entirely or partly able to follow an occupation from one year and two months to fourteen years and eight months after the operation. In cases in which freedom from bacteria cannot be achieved, a supplementary operation, prefer-

ably an apicolysis with paraffin tamponade, should be performed.

HAAKSEN (2)

Holt, J. Locally Limited Selective Thoracoplasty in Pulmonary Tuberculosis (Ueber örtlich begrenzte "selektive Thorakoplastik bei Lungentuberkulose") *Archiv f. Lageridensch.* 1933 xiv 361

Eighteen partial apical and upper lobe plastic operations in cases of localized tuberculosis are reported. The operations were carried out according to two different methods

1. In eight operations (seven patients one with bilateral tuberculosis) resection of the fourth fifth and sixth upper ribs and pneumolysis of a considerable portion of the upper lobe were done. The chest wall minus the ribs was transformed into a broad-based periosteum-muscle flap which was spread out over the apex of the sunken in lung freed of adhesions. Over this soft tissue flap a tampon was placed. The result was complete healing of the cavity in seven cases and diminution of the cavity in one case. In one case an infiltration of the lower lobe occurred postoperatively. On clinical and roentgenological examination, six of the patients appeared to be healed.

2. In ten operations total exstirpation of the two upper ribs with cutting through of all the scapular attachments and resection of pieces of decreasing size from the third to the seventh rib was done. In some of the cases apicolysis was carried out, while in others the operation was done extrapleurally. Complete collapse of the cavities resulted in seven cases and partial collapse in two cases. One patient died of pneumonia of the lower lobe of the affected lung three weeks after the operation. All of the patients were examined with the X rays from two to three weeks after the operation. In cases of insufficient collapse of the cavities, resection of the anterior portions of the third to the fifth or sixth ribs anteriorly from the axilla was usually performed immediately. This second procedure must be carried out before new development of the resected ribs occurs.

The effect of these plastic operations depends upon lateral compression of the upper lobe of the lung, shortening of the horizontal axis of the lobe and shortening of the longitudinal axis of the lung. The lung lobe sinks down as a result of the cutting of the scapular muscle and the apicolysis. These types of operation alter and widen the indications for surgical treatment in pulmonary tuberculosis. They widen the indications because they permit operation even in bilateral cases. Otherwise a smaller and less traumatic procedure—such as the partial plastic—would be recommended instead of an extensive crippling operation of the total plastic type. They alter the indications as the described operative technique makes phrenic excursions superfluous in cases of tuberculosis localized in the apex and upper lobe. The apicolysis operation permits use of the normal lower lobe of the lung whereas excursions renders this impossible.

The author emphasizes the great importance of co-operation between the surgeon and the tuberculosis specialist and believes that the operative treatment of pulmonary tuberculosis should be carried out only in certain hospitals. By means of this treatment a percentage of the most dangerously infectious patients can be cured, a fact of great hygienic importance. This method of treatment is important also from the economic point of view as it requires a much shorter time and therefore is much cheaper than any other treatment of pulmonary tuberculosis.

KORITZINSKY (2)

Ascoli, M.: Non Tuberculous Suppurations of the Lung (Nichttuberkulöse Vereiterungen der Lunge) *Verhandl. d. Kong. internat. Ges. Chir.* 1932 14, 163

Ascoli reports upon the knowledge and experience gained during the past five years with regard to true lung abscesses, that is collections of pus in the pulmonary parenchyma. Pulmonary gangrene bronchiectasis and actinomycosis are not considered.

Lung abscesses are divided into (1) the acute abscesses due to pus bacteria which are located in the parenchyma of the lung either centrally or peripherally and tend to heal spontaneously by breaking through into a bronchus or the pleural cavity or to the exterior of the body (2) the acute, primarily putrid abscesses without laudable pus which seldom heal spontaneously and usually tend to infiltrate the lung progressively rendering the prognosis unfavorable and (3) the suppurative pneumonia arising from septic contamination of the air passages in cases of bronchopneumonia. Chronic abscesses develop as a rule from the acute forms especially the putrid forms. In the chronic abscess there is often a large cavity with several small cavities which are in communication with one or several bronchi. To these is usually added a secondary bronchiectasis. The sputum is more frequently foamy than purulent.

In Italy the incidence of lung abscess is not very high. In the surgical clinics in Rome a pulmonary abscess is found in only 2 of every 1,000 patients. Of 27 patients whose cases are reviewed by the author 66 per cent were between twenty and forty years of age and 77 per cent were males. In 51.7 per cent the condition could be traced to a grippal pneumonia. In 63 per cent the right lung particularly the middle lobe, was the part affected. In the left lung the lower lobe was involved most often. Bacteriological examination revealed diplococci streptococci, staphylococci, and all types of anaerobes.

With regard to the pathogenesis of pulmonary suppuration, the author states that he prefers the 'ab ingestis' theory to that of embolism. He was able to prove the former experimentally after inducing conditions as nearly as possible like those following operation by reducing the resistance of the respiratory tract to infection by producing a fistula between the oesophagus and trachea. Especially important as an etiological factor in pulmonary abscess is bronchopneumonia. Less important is lobar pneumonia. Chronic bronchitis and bron-

chielectasis extending into the parenchyma of the lung usually cause chronic abscesses. Other causes of lung abscess are subphrenic abscess, lymphadenitis of the mediastinum, encapsulated empyema, pathological communications between the air and food passages, septic emboli, foreign bodies which have entered the respiratory passages (anesthetics, epileptic attacks), and open and closed lung injuries.

In cases of chronic abscess the possibility of tumor should always be considered as a tumor may closely simulate an abscess by breaking down or may produce an abscess by causing pressure necrosis. Catarrh of the nasal sinuses may produce an abscess in the lung by way of the lymph channels.

The symptoms of lung abscess include cough and expectoration. In 9 of the author's cases the sputum contained blood in 33 per cent, elastic fibers and in more than 33 per cent hematoidin crystals. The sputum is not so copious as in cases of bronchiectasis, and after standing awhile in a glass it separates into 3 typical layers: an upper foamy layer, an opalescent middle layer and a green lower layer. The fever usually falls when the abscess breaks through. Localized spontaneous pain was present in 18 of the cases reviewed, and pain was elicited by pressure in 17. The abscess is nearest the chest wall at the point where the pressure pain is most clearly localized. Hemoptysis is a frequent manifestation. It was present in 9 of the cases reviewed. Clubbing of the fingers was found in only 3 cases.

To clear up the diagnosis and the localization the author especially recommends stereoscopic roentgenograms. If a pleural effusion is present it should be removed and a pneumothorax substituted. Adhesions of the pleura to the chest wall will then be demonstrated very distinctly. Bronchoscopy is scarcely of any value in the diagnosis of lung abscess.

Of the author's 27 cases, 3 became cured spontaneously, 13 were cured by operation, and 11 treated surgically were fatal. In the cases in which operation was performed when the disease had been present less than six months the mortality was 19 per cent, whereas in the remainder in which the average duration of the illness preceding the operation was ten months, the mortality was 73 per cent. Metastatic brain abscess developed in 10 per cent of the cases.

The author has obtained only temporary results with neomycin. Bronchoscopic treatment is indicated only in cases of foreign bodies which can be removed with the bronchoscope. Pneumothorax is especially applicable in cases of centrally located abscesses of not more than three or four months duration which have established good drainage through the bronchus and are associated with too extensive pleural adhesions. The pressure from the intrapleural air cushion should never be permitted to choke off drainage through the respiratory passages. Treatment by pneumothorax should be continued for four or five months. In three of the author's cases, in which pneumothorax was continued for from six to twelve months, striking improvement occurred, but when the pneumothorax

was stopped the process flared up again and operation became necessary.

In cases of chronic abscess (those which have failed to heal in two or three months) the methods cited have no indications and only operation is of any value. In the author's opinion, phrenic excision is not very successful as, by retracting, the elastic parenchyma of the lung nullifies the mechanical pressure obtained from the elevation of the diaphragm. In any case, simple crushing of the nerve, which in the author's experience achieves immobilization of the diaphragm for as long as six months, is to be preferred. In one of the author's cases pneumolysis by means of paraffin filling was done, but operation became necessary two months later. Ascoli recommends resection of a rib to facilitate compression of the lung against the chest wall by the mass of paraffin. He rejects intrapleural pneumolysis because of the danger of infection. When collapse therapy is to be attempted, extrapleural pneumolysis by means of paraffin injections is preferable to extrapleural thoracoplasty because thoracoplasty hinders expectoration. For peripherally situated monolocular abscesses pneumotomy is the method of choice. However, the author warns against exploratory puncture through the chest wall.

Abscesses of the upper lobe are best reached through the anterior aspect of the chest, those of the middle lobe, from the side and those of the lower lobe, from behind. Ascoli operates under paravertebral intercostal nerve anesthesia. Two or three ribs are resected for a distance of from 10 to 15 cm. When pleural adhesions are present the pericostum and soft parts are removed in the area of resection to assure good access to the lung. The abscess is then located by means of the aspirating needle and is opened with the thermocautery. For drains, gauze saturated with balsam of Peru is recommended as dry gauze adheres to the wound edges and rubber tubing produces pressure ulceration. During the operation Ascoli keeps the patient's head lower than the chest to guard against cerebral air embolism. If pleural adhesions have not developed, general anesthesia with positive pressure is induced and the pleura is opened. If the site of adhesions has been missed, the pleura is immediately closed hermetically and a new incision is made at the site of the adhesions, or further procedures are delayed for several days to allow the formation of adhesions, or the pleural cavity is packed off and the abscess is opened at once. When delay is possible, the formation of adhesions may be stimulated by paraffin injections or by extrapleural tamponade with gauze followed by resuture of the skin. The paraffin filling should be extensive but not very thick. After seven days, adhesions are usually well developed and the abscess may be opened. Healing requires about three months.

When resection is indicated, the author favors the 2-stage operation of Lockwood and Graham. In the after-treatment the Garré Lebacqz operative method has proved most satisfactory. In 1 case Ascoli

ceeded in converting a bronchopleural fistula into a bronchocutaneous fistula by the Schede operation.

The world literature on non tuberculous suppurations of the lung for the past five years is reviewed and a very extensive bibliography is appended.

CARALDI (Z)

Baumgartner A.: Surgical Treatment of Non-Tuberculous Pulmonary Suppurations (Chirurgische Behandlung der nichttuberculösen Lungenerkrankungen). *Verhandl. d. Kong. internat. Ges. f. Chir.* 1932 II, 101.

This report is based on 101 cases of non-tuberculous lung suppurations which were treated conjointly by departments of internal medicine and surgery.

Of importance in the prognosis of such suppurations is the differentiation between true interlobar suppurations and suppurative processes situated in the pulmonary tissues near the interlobar fissures. In the clinical differentiation between localized abscesses and bronchiectasis, filling of the bronchial tree with liquid is of great aid. With regard to the indications for operation the following rules should be borne in mind.

1 Operation should not be done routinely as soon as the diagnosis is made as many suppurative pulmonary conditions become cured spontaneously or under medical treatment.

2 All methods of collapse therapy are to be mistrusted to the same degree as the never-adequate suction with the bronchoscope.

3 Necessary operative interference should not be delayed too long.

Baumgartner has found that the best time for the opening of an abscess is from six to eight weeks after the first manifestations of the condition, and that operation for gangrene should be delayed for about two weeks. A longer expectant period permits the development of suppurative and sclerosing pneumonic processes in the vicinity of the original focus, which have an unfavorable effect on the results. The operation consists of simple pneumotomy in the less complicated processes or of partial resection of the diseased portion of the lung.

In order to clarify the nomenclature used for pulmonary suppurative conditions, which varies with the different schools of teaching and in different countries, Baumgartner suggests that the term "pulmonary abscess" be used to designate a localized suppuration in the lung which occasionally heals spontaneously and the term "pulmonary gangrene" to designate a primary necrosis of the pulmonary tissue which is followed by a suppurative breaking down and is almost always fatal. Between these two extremes are to be found transitional forms which appear initially as an ichorous suppuration with the characteristics of a primary necrosis, suppuration, and sclerosis of the surrounding tissues and tends to become chronic. The clinical pictures of these different pathological processes are described in detail. Bronchiectasis may be compli-

cated by abscess formation in the surrounding pulmonary tissues. The diagnosis of pulmonary suppurations is rendered difficult by the co-existence of a pleural effusion.

In the discussion of the possibilities of internal treatment, injections of serum and of vaccines are mentioned. The author has never seen convincing results from neosalvarsan. He states that collapse therapy should never be resorted to when the abscess is near the pleura and even when it is situated elsewhere valuable time should not be lost by this method. Phrenic excision alone is not apt to effect a cure. It is merely a supportive measure. Drainage of the abscess through the bronchial tree has been attempted by the Quincke postural drainage and by bronchoscopy but is nearly always inadequate. The true causal therapy of pulmonary suppuration is a direct surgical attack on the purulent focus. The operative methods for the various forms of pulmonary suppuration are discussed in detail. For the localized fresh abscess and for the beginning purulent abscess direct opening up of the purulent focus with external drainage is the simplest and most satisfactory method of treatment. Abscesses which begin as ichorous abscesses and gangrene should be treated by pneumotomy with removal of the outer pulmonary wall of the pus cavity. Chronic and diffuse pulmonary suppurations always demand partial resection of the diseased lung tissue. Extensive bronchiectasis with abscesses in the surrounding pulmonary tissues justifies the removal of an entire lobe of the lung. In cases complicated by a purulent pleural effusion, opening up of the suppurative focus and removal of the diseased tissues is followed by cure only when a Schede plastic is added. The technical details and the complications of this operation are shown by some of the author's own cases. Removal of an entire lobe was attempted in only 1 case and had an unfavorable outcome.

The article is concluded by an extensive review of the literature.

F. KLINGS (Z)

ESOPHAGUS AND MEDIASTINUM

Bircher: (Esophagus Surgery (Zur Esophagus-Chirurgie). *Verhandl. d. Kong. internat. Ges. f. Chir.* 1932 I 535.

In the introduction to this report Bircher calls attention to the enormous amount of literature on surgery of the esophagus. He states that surgeons—von Hacker and von Mikulicz—laid the foundations for esophagoscopy the procedure which, next to roentgenoscopy and roentgenography of the esophagus, was of most importance in rendering esophageal surgery possible. He limits his discussion to:

- 1 Strictures and dilatation of the esophagus
 - a. Total dilatation—cardiospasm.
 - b. Local dilatation—diverticula.
 - 2 Tumors of the esophagus and esophageal plastics.
 3. Foreign bodies in the esophagus.
- In summarizing the first portion of his article, Bircher says that operation is indicated in all cases

of cardiospasm with dilatation of the oesophagus in which dilatation procedures or continuous sounding has failed to effect a cure. Anastomosis of the oesophagus to the cardia has proved the surest and most reliable method. In suitable cases plastic section of the oesophagus has also given good results. In recent times the technique of total extirpation of the stomach has been modified so that anastomosis of the stomach to the oesophagus or the cardia is no longer opposed. As in the Billroth II procedure the duodenum is first closed. Then, on the oesophagus or the cardia, a double jejunal loop is brought up, into which the proximal stump of the cardia or the oesophagus can be easily introduced by Bircher's procedure. A Braun entero-anastomosis should be added. Jejunostomy is advisable for feeding.

The surgical treatment of oesophageal diverticula is the most satisfactory and perfected phase of oesophageal surgery. The work of Lotheisen is cited. In discussing diverticula due to traction the author describes irrigation of the diverticula. He states that operation seldom produces a cure. The chief field for sac extirpation is the treatment of pharyngo-oesophageal diverticula. In cases of deep diverticula, treatment with metal dilators by Bruening's method is indicated; excision is too dangerous. The surgery of diverticula is concerned chiefly with the Zenker pulsion diverticulum. In the treatment of traction diverticula surgery is of secondary importance.

The methods of operation are (1) diverticulectomy (2) invagination by Girard's method, (3) ligation according to the Goldmann Beck method and (4) resection of the diverticulum in 1 or 2 stages separation of the mediastinal portion and the formation of an anastomosis between the stomach and the diverticular sac.

The surgery of cancer of the oesophagus, including the cardia, finds its highest achievement in the removal of cancerous portions from the oesophagus. Its development has been based on numerous animal experiments many investigations on human beings, great sacrifices, and isolated and transitory results. The methods to be considered are (1) total resection of the cancer (2) palliative gastrostomy (3) intubation treatment and (4) radium and roentgen therapy combined with surgery.

In summarizing Bircher says: If we review all of the procedures used in the 100 cases on record—

probably as many others have not been reported—we must admit that, in spite of success in a cases, radical operation for carcinoma in the thoracic portion of the oesophagus by various methods and combinations of methods has failed."

Bircher next discusses abdominal resection of the cardia. This procedure also is unsatisfactory as palliative measures such as gastrostomy tube, and oesophagoplasty are always necessary. Antethoracic oesophagoplasty is the highest development of plastic surgery. In its perfection many surgeons in all countries have had a part. According to Lotheisen, gastro-oesophagoplasty has the highest mortality (75 per cent) of the radical operations. It may be divided into the following types:

1. The formation of the oesophagus from the stomach as a whole.
 - a. Isoperistaltic.
 - b. Anteperistaltic.
2. The formation of the oesophagus from a part of the stomach.
 - a. From the greater curvature.
 - b. From the anterior wall.

In summarizing Bircher says: Today the artificial formation of a functioning oesophagus may be regarded as an operation with a well worked-out technique which is of definite value in carefully selected cases. There are a variety of methods, all of which give satisfactory results. The simplest and safest procedure, which in recent years has become more and more popular is the dermato-oesophagoplasty. Next to be considered from the standpoint of safety is the coloplasty. The jejuno-plasty is complicated and therefore very dangerous. The gastrophasties are such major operations that they are performed only exceptionally.

In discussing foreign bodies in the oesophagus the author states that diagnosis with exact localization of the foreign body before operation is important. The operative procedures for oesophageal foreign bodies are cervical oesophagotomy, gastrostomy and thoracic oesophagotomy. Among the complications which may arise in the treatment of oesophageal foreign bodies are hæmorrhage, which is often very severe, cellulitis of the neck, which is relatively frequent, and mediastinal cellulitis.

The report has a bibliography of 334 references.
E. OLSEN (2)

SURGERY OF THE ABDOMEN

GASTRO-INTESTINAL TRACT

Wilkinson, J. F. The Anti Anæmic Principle in Stomach Tissue. *Proc Roy Soc Med.*, Lond., 1913, xxvi, 1341

The term "hemopoietin" has been suggested for the active hemopoietic principle contained in stomach tissue. This principle has different properties from those of the active principle in liver and is much more unstable than the latter. It is present in the silver fox as well as in the hog and is apparently absent in such herbivorous animals as the sheep and ox. The effectiveness of hemopoietin can be determined only in carefully controlled cases of pernicious anemia, with the use of reticulocytosis and an increase in the red cells as criteria. Many active fractions have been obtained. Pepsin appears to be always associated with hemopoietin and is difficult to separate from it. Two fractions have been prepared by iso-electrical precipitation. One of them contains practically all of the pepsin and is clinically inactive in doses of 7.5 gm. The other is almost free from pepsin and gives good clinical results when administered by mouth in doses of 5 gm. daily.

WALTER H. NADLER, M.D.

Beocq P., and Ortega S.: The Early and Late Results Obtained by Different Methods of Operation in Seventeen Cases of Hourglass Stomach Secondary to Gastric Ulcer (Dix-sept cas de biloculation gastrique organique d'origine ulcéreuse opérés par différentes méthodes. Résultats immédiats résultats éloignés) *Bull et mém. Soc nat de chir* 1913 lviii, 1508.

In one of the cases reported three operations were performed. The first was a gastro-enterostomy in which the superior or proximal gastric pouch was used, the second, a gastrogastrostomy and the third, an operation for the separation of adhesions. Four cases were treated by gastrogastrostomy, four cases by sleeve resection, and one case by gastro-enterostomy in which the proximal pouch was used and the distal gastric segment was resected. In six cases, resection of the stomach was done by either the Billroth II or the Polya Finsterer technique. In one case both gastric pouches were excised.

Two of the patients died in the hospital and two died several months after leaving the hospital in good condition. In five cases the operation was performed too recently to permit an opinion regarding the late results. Twelve patients who were operated upon from three to nineteen years ago are now in good condition. The authors conclude that the best results are obtained by radical resection, and that gastro-enterostomy should be done only when the patient is unable to withstand more extensive surgery.

SAMUEL J. FOOTELOW M.D.

Roeder C. A.: Total Gastrectomy *Ann Surg* 1933, xcvi, 221

The author reports three cases in which he performed total gastrectomy and reviews eighty-five cases collected from the literature. The first total gastrectomy was performed by Conner in 1884. The first partial gastrectomy on a human being was done in 1879 by Pean and the first partial gastrectomy with a successful result by Billroth in 1881. In 1897 Schlatter reported the case of a patient still living fourteen months after a total gastrectomy.

In the eighty-eight cases of total gastrectomy reviewed by Roeder there was an operative mortality of forty-four deaths due to shock, hemorrhage or peritoneal or pulmonary infection. Recurrences of cancer after gastric resection are usually found in the remaining portion of the stomach, the liver or the retroperitoneal lymph nodes. From a study of the intramural extension of the cells of gastric carcinoma, Verbrugghen concluded that at least 4 cm. of apparently healthy stomach wall should be removed with the growth.

Essentially the technique of total gastrectomy includes resection or mobilization of portions of the costal cartilages of the left side to provide better exposure, the preparation of an artificial stomach by a 6-in. entero-anastomosis, and suspension of the artificial stomach to the stump of the esophagus.

Of the authors' three patients treated by total gastrectomy one died three days, and another died five days after the operation from pulmonary edema and gangrene. Both of these patients had carcinoma. The third patient presented an epi-gastric mass which was found to be crater like and to extend up the posterior wall of the stomach to a point near the cardiac orifice. On section of the tumor no malignant cells were discovered and the neoplasm was found to be of an inflammatory nature.

ROY A. LUNDHOLM M.D.

McIver M. A.: Acute Intestinal Obstruction. Eighth Installment. *Am. J. Surg* 1933 xxi 307

In this article McIver discusses the pre-operative, operative and post-operative treatment of acute intestinal obstruction.

In the pre-operative treatment, pain should be relieved by the administration of morphine as soon as the diagnosis is made and measures should be taken to maintain the body temperature, especially in the type of case in which collapse is impending. Undue exposure during examinations should be avoided. As the patients have usually lost considerable water and are dehydrated it is important to replace the water as well as the electrolytes, sodium and chloride. This should be done preferably by the administration of isotonic salt solutions and a 5 to

10 per cent solution of dextrose. The fluid may be given subcutaneously intravenously or by rectum. If there is considerable dehydration, all three routes should be employed. The author recommends the administration of normal saline solution by rectum. Pre-operative gastric lavage is important, especially in the cases of patients who have vomited.

The anesthetic should be chosen according to the requirements of the particular case. The use of ether is followed relatively frequently by shock and collapse and inhibits peristaltic activity. Novocain is often the anesthetic of choice, especially in the more serious cases in which extensive exploration is contemplated. In novocain anesthesia the danger of the aspiration of vomitus is avoided, but complete muscular relaxation is not obtained. Nitrous oxide has no depressing action, but unless it is carefully given the relaxation of the abdominal muscles is poor. Spinal anesthesia is frequently used because of the complete relaxation it affords. However on account of the danger of shock, it should be used cautiously in the cases of patients who are extremely ill. The mortality associated with the use of various types of anesthesia and anesthetics in cases treated at the Massachusetts General Hospital in the period from 1908 to 1917 was as follows: ether 25 per cent, spinal anesthesia 0 (used in only 1 case), local, 69 per cent, novocain and general, 60 per cent, nitrous oxide-oxygen, 75 per cent, and ethylene 11 per cent.

In the operative procedure, gentleness and care must be employed as manipulation not only tends to injure the bowel, but greatly increases the shock and possibly the permeability of the intestine. In the cases of extremely ill patients an enterostomy should be done without exploration if the obstruction is in the small intestine and there is no evidence of strangulation. If the obstruction is in the large bowel, a caecostomy should be done with a large tube. In cases in which exploration is undertaken it should be done by means of a hand placed in the abdominal cavity to determine the presence of bands, a growth or volvulus. If the conservative method of exploration is impossible, partial or complete eversion is essential.

The character of the peritoneal fluid is of importance. In a recent series of 335 cases at the Massachusetts General Hospital there were 21 cases in which blood-stained fluid was present and gross interference with the mesenteric blood supply was found. In a number of cases the fluid was described as foul-smelling.

The author believes that Monks' method of identifying the small intestine is of value.

Evacuation of the distended loop of bowel is accomplished best by aspiration after the introduction of a fine needle into the lumen of the bowel.

In some cases the cause of the obstruction may be removed directly as by the division of constricting bands, the untwisting of a volvulus, or the reduction of the strangulated hernia or intussusception. If the obstruction cannot be removed, an enterostomy or an entero-enterostomy is often indicated. In cases

in which resection is considered the viability of the bowel must be determined. The appearance of the peritoneal coat should be noted. If the peritoneal coat has lost its normal sheen and is a dull gray and covered with fibrin the bowel is probably not viable. Palpation is helpful as the viable intestine has a certain tone which can be felt, whereas the non-viable bowel has a relaxed, sodden feeling. The presence or absence of peristalsis should be noted. In doubtful cases the loop should be wrapped in a sponge of warm saline solution and a short time allowed for the circulation to become re-established. If doubt still remains, the loop should be brought out and the peritoneum closed around it. If a small necrotic area is present it may be infolded. After the resection of a portion of bowel it is necessary to decide whether an anastomosis should be done immediately. If the necrosis is high in the intestinal tract anastomosis is probably advisable as fistulae in this portion are not well tolerated. Paul tubes may be introduced into both segments and subsequently joined by means of a rubber tube.

In 33 resections done at the Massachusetts General Hospital there were 16 deaths, a mortality of 48 per cent. In 9 cases in which the anastomosis re-establishing the continuity was performed immediately there were 7 deaths. In 13 cases in which the ends of the intestine were brought out and anastomosis was delayed for a future operation there were 9 deaths. In the cases in which only relief of the obstruction was done the mortality was 19 per cent. In those in which the obstruction was relieved and the bowel drained, it was 55 per cent. In cases treated by drainage of the bowel alone the mortality was 58 per cent. In those treated by resection, it was 75 per cent, and in those treated by miscellaneous operations, it was 83 per cent.

ALTON OCHSNER, M.D.

Wahren, H.: Studies on the Relationships of Gas Metabolism in the Intestine in So-Called Paralytic Ileus. A Clinico-Experimental Investigation (Studien über die Gasewechselverhältnisse im Darm bei sogenannten paralytischen Ileus. Eine klinisch-experimentelle Untersuchung). *Acta chirurg. Scand.* 1933 122, Supp. xxvii.

The author deals with the ileus that develops during a progressive septic peritonitis and may be associated with certain traumatic conditions. The main symptom is meteorism. The theory prevails that the cause of the paralytic ileus is paralysis of the gut, but it has been shown that no condition which might be characterized as paralysis of the gut occurs during the peritonitis, and studies of the motor function of the intestine have failed to offer an explanation. Clinical experience teaches that meteorism may develop in association with various traumatic affections such as trauma to the trunk and laparotomy, but none of the theories to date with regard to the origin of meteorism has been generally accepted. In experimental studies there was no increase in the production of gas by the intestinal contents, but

as a result of disturbances of the circulation an increased accumulation of carbon dioxide occurred in the intestinal wall and the surrounding tissues. Studies on the conditions of resorption in experimental septic peritonitis showed a marked reduction of resorption in the later stages of the condition. This also may be a result of the disturbance of the circulation during peritonitis. The dilatibility of the intestinal wall is not increased.

Studies on the gas metabolism in the intestine after experimental trauma revealed a slight increase in the production and a marked decrease of the resorption of gas when one or both kidneys were transected instead of the intestine.

The relationship between intra intestinal pressure and the circulation in the intestinal wall is emphasized, and attention called to a probable relationship between increasing intra intestinal pressure impairment of the circulation and deterioration of the general condition.

The author believes that in the development of mechanical and paralytic ileus disturbances of the circulation are of more importance than intestinal obstruction.

LOUIS NEUWALT M.D.

MacCaino, G. The Design of the Mucosa of the Large Intestine in Normal and Pathological Conditions (Il disegno di mucosa del grosso intestino in condizioni normali e patologiche) *Radiol med* 1933, xi, 573

According to the studies of Forsell, the mucosa of the digestive tract is endowed with a plastic autonomy and is able to mould itself in various ways according to the requirements of digestion. The author describes the technique necessary to determine the design of the mucosa of the large intestine.

In a study of the different phases of the emptying of the bowel during the administration of enemas special attention was directed to the sphincter muscle which acted like a true motor center governing the peristaltic activity of the colon. The design of the mucosa under normal conditions and the various changes observed in many morbid states are described. In constipation there is found along the descending colon and sigmoid a predominance of transverse folds. In inflammatory processes there is a change in the normal arrangement with marked irregularity in the distribution and a thickening of the folds. These changes are especially marked in ulcerating colitis in which in the acute stages, there is a total loss of design with the presence of ulcers and, in the later phases, an areolar appearance followed by a granular appearance.

In chronic appendicitis there are found in addition to the changes in the appendix itself, marked changes in structure in the head of the caecum caused by the constant spread of the inflammatory reaction into the caecum.

In stenosis, not only the condition of the mucosa but also the capacity of the bowel wall to distend is altered. The ability of the wall to distend is destroyed by infiltrating processes.

In diverticula of the colon the design of the mucosa which is normal in the first stage, ultimately becomes greatly altered by the superimposed inflammatory process and assumes the appearance of an accordion because of thick transverse folds. In invagination of the colon characteristic images appear such as opaque rings spirals and onion like arrangements which are an expression of the arrangement of the mucosa as it curls on the invaginated portion.

KELLOGG SPEED M.D.

Pellegrini O. A Case of Severe Appendicitis in a Herniated Appendix (Un caso di grand'appendicite in appendice erniata) *Clin chir* 1933 ix 666

The case reported was that of a child eleven years old who developed acute appendicitis in an appendix which lay in an inguinal hernia on the right side. A fecalith lodged in the proximal end of the appendix caused necrosis of the appendiceal wall and spontaneous amputation of the appendix. The proximal stump of the appendix then retracted into the abdomen so that the fecal contents escaped into the peritoneal cavity. Death resulted from general peritonitis.

According to the literature the appendix is found in the hernial sac in from 0.20 to 0.80 per cent of cases of hernia. In the author's clinic it has been found in a hernial sac once in 270 patients.

A. LOUIS ROSE M.D.

Palma R., and Perona, P.: Appendicitis, Pericholecystitis, and Periduodenitis (Appendicite, pericolecistite e periduodenite) *Arch ital di chir.*, 1933 xxxiii 709

Essential periduodenitis has been described as a pathological entity by Duval, Donati, Leotta, and others. The term should be limited to cases of periduodenitis in which the lesion is confined to the duodenum and there is no other lesion such as ulcer of the stomach or duodenum, appendicitis or inflammatory processes in the gall bladder, ascending colon or elsewhere which might be the cause of the condition. The diagnosis is very difficult as the exclusion of other lesions requires an accurate clinical check up supplemented by roentgenological and operative control.

The authors report seventeen cases which show the relationships between appendicitis, pericholecystitis, and periduodenitis. This group is of interest because it may serve to explain the persistence of symptoms following surgical operation on the appendix, gall bladder, and duodenum. Fourteen of the patients were women who complained chiefly of dyspepsia. In some cases the dyspepsia was accompanied by vague pain in the region of the appendix or gall bladder. Constipation was common.

Examination usually reveals nothing in particular, but in some cases there may be tenderness in the region of the appendix or the right upper quadrant of the abdomen. Operation usually discloses an in-

inflammatory lesion in the appendix and membranous adhesions between the organs secondarily involved and the adjacent structures.

The authors believe that in most of their cases the initial lesion was a chronic appendicitis, and that the involvement of the other organs took place through the lymphatics.

In discussing the roentgenological aspects of perivisceritis they state that the demonstration of deformity of the organs or abnormality of their function by the roentgen ray may furnish important aid in the diagnosis.

EUGENE T. LEROY, M.D.

Bensaude, R.: Primary Anorectal Actinomycosis (L'actinomycose ano-rectale primitive) *Presse med. Par.* 933, XII, 37

Anorectal actinomycosis has a very poor prognosis when it is not recognized early or is left untreated. Its diagnosis is difficult because in the great majority of cases the possibility of the condition is not given much consideration. Treatment by surgery, the administration of iodine, or irradiation is effective only in the early stages.

The author discusses only actinomycosis which is primary in the anus and rectum, leaving out of consideration the cases in which the actinomycetes become lodged first in the region of the cecum, the appendix, the ovary or the bladder and invade the rectum and surrounding tissues secondarily. However, primary actinomycosis of the rectum is not a primary lesion of the coats of the rectum like that occurring, for example, in rectal tuberculosis. In the great majority of cases there is primary involvement of the perirectal connective tissue after penetration of the parasite through the anorectal mucosa or the perianal tissues. The condition is therefore essentially a primary perirectal or pararectal actinomycosis usually of rectal origin.

Next to the mouth, neck, and esophagus, the intestinal tract is one of the most frequent sites of involvement by actinomycetes. In the intestines the most common site of actinomycosis is the region of the appendix and cecum, and the next most common site the anorectal region. In 1902, Thorenot collected fifteen cases of anorectal actinomycosis, primary and secondary. The author has been able to find the records of twenty cases of the primary type.

The anatomical lesions of anorectal actinomycosis are strikingly similar in all cases. Ulcers of the mucosa are rare, but deep, burrowing abscesses containing the actinomycetes are found with a woody hardness in the pararectal tissues. The discovery of the characteristic yellow granules is diagnostic.

The inoculation occurs most frequently by the descending route, the actinomycetes being ingested with food such as milk, poorly baked bread, or meat. Inoculation by the ascending route occurs from external contamination of the anus and is most common in farmers who come into contact with infected straw and earth.

The author reports a case to show the ease with which the condition may be confused with hemor-

rhoids, the characteristic narrowing of the rectal lumen and ampulla, the woody induration of the perirectal tissues, and the pliability of the mucosa over the induration.

The condition passes through the following four phases: (1) an initial phase with pain in the buttocks, diarrhoea, colic, and fever; (2) a phase of woody infiltration and perirectal stenosis, in which the mucosa appears normal on rectoscopic examination; (3) a phase of abscess formation and fistulization in which the inguinal glands remain uninvolved unless secondary infection occurs, and ultimately general evidence of toxicity develops; and (4) a phase of complications at a distance such as involvement of the liver.

The prognosis is very unfavorable. Only one of the twenty cases collected by the author from the literature was cured. Death is usually caused by local spread of the infection and amyloid degeneration of parenchymatous organs with or without septicemia.

The surgical treatment should consist of wide excision. However, this is often impossible because the condition is not diagnosed sufficiently early. Under such circumstances, local drainage or iodine with curettage may be tried. Large doses of potassium iodide or surgical salts have been tried. According to some reports, improvement has followed roentgen or radium irradiation combined with medical and surgical treatment. In South America a vaccine therapy has been used.

KILLGUS SMITH, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Buettner, W. and Lammal, G.: The Condition of the Liver and Gall Bladder in the Presence of Minute Stones in the Bile (Ueber das Verhalten von Leber und Gallenblase beim Vorkommen von Mikrolithen in der Galle) *Arch. f. path. Anat.* 1913, cxlxxviii, 65

Of 800 successive autopsies, small stones were found in the bile in 75 (9.4 per cent). The data on which the authors' conclusions are based are presented in tabular form.

The formation of the stones was favored by age and biliary stasis. In general, minute stones were found in the bile only in the presence of pathological changes in the liver. Purely mechanical stasis of bile without liver damage was not sufficient for stone formation. Minute stones were found also in association with inflammation of the mucosa of the gall bladder. Apparently the formation of these minute stones took place in the small bile passages, particularly in the liver, but also in the gall bladder. However, in the majority of the cases the gall bladder showed not even the slightest change. The portion of the biliary tract responsible in a particular case can usually be determined only from the general pathological picture.

The liver changes which are always present include the following conditions: brown atrophy, liver dis-

case with gradual or rapid massive destruction of the parenchyma liver changes associated with severe specific or non specific inflammation, and milder changes, chief among which are an increase in the interstitial connective tissue and degeneration. Newly formed minute stones usually indicate recent changes in the liver and older stones indicate more chronic changes. The formation of the minute stones is due entirely to diffuse or circumscribed liver-cell damage. To the extent that liver-cell damage is frequently a manifestation of constitutional disease, the formation of minute stones is also related to constitutional disease. In cases in which minute stones are present there seems to be a disturbance of the secretory function of the liver. This theory is supported by the following facts:

1. Bile which is poor in pigment contains minute stones more frequently than bile which is rich in pigment.
2. Gall bladders with relatively small amounts of bile contain stones oftener than those with large quantities of bile.

A. STAFF (Z)

Newman, G. The Physiology of the Gall Bladder and Its Functional Abnormalities. I. Physiology. II. Disorders of Motility. III. Abnormalities of Concentration and Secretion in the Gall Bladder. *Lancet* 1933 cccxv 841-896

In reviewing the physiology of the gall bladder Newman discusses the concentration of the bile, the structure, function, and mechanism of emptying of the gall bladder, the expulsion of bile in the absence of a gall bladder and nervous and pharmacological stimuli.

CONCENTRATION

Since the work of Rous and McMaster, concentration of the bile has been recognized as a function of the gall bladder. Rous and McMaster showed that 49.8 c.c.m. of bile are concentrated by the gall bladder to 4.6 c.c.m. in twenty two and a half hours, and that by simply flowing through the gall bladder the bile is concentrated from two and three tenths to four and eight tenths times. The concentration is effected by the columnar epithelium of the fundus and body. The mucous glands of the infundibulum can secrete 20 c.c.m. of mucous fluid a day. The remainder of the extrahepatic bile tract dilutes the bile with mucus and does not concentrate it. Blond says that under the influence of Carlsbad salts the liver can secrete a twenty times concentrated bile.

Concentration of the bile is effected mainly by the absorption of water. As it progresses, sodium chloride is absorbed more rapidly to keep the total osmotic concentration the same as that of liver bile and serum. During the concentration acidity increases. Contrary to the previous belief that acidity influences the formation of stones, organized crystalline stones resembling stones can be made by alkalinizing bile. The administration of acid or alkali by mouth does not affect the hydrogen ion concentration of bile in man.

Calcium is excreted by the liver also by the gall bladder when the cystic duct is obstructed. It is not secreted by the normal gall bladder but is concentrated by the absorption of water and to some extent is absorbed.

Bilirubin also is concentrated chiefly in the gall bladder from five to forty times (usually twenty times) whereas other constituents are concentrated only from five to ten times.

The secretion of cholesterol and bile salts by the gall bladder has been a subject of controversy since Naunyn's contention that cholesterol is secreted by the gall bladder and Aschoff's denial of this theory. It is now generally believed that the normal gall bladder does not secrete cholesterol. In twenty four hours a man secretes 0.4 gm. of cholesterol and 5 gm. of bile salts. The latter hold the cholesterol in solution by forming a water soluble addition compound. The quantity of bile salts varies inversely with the acidity of the bile. The water-soluble addition compound is absorbed by the gall bladder. Cholesterol is not absorbed to any significant extent.

Mucin is added to bile in the gall bladder. Albumin and globulin are not present in normal bile and are not secreted by the normal gall bladder. Fats, lecithin and soaps are formed by the liver and concentrated in the gall bladder.

MOTOR MECHANISM

The filling and emptying of the gall bladder depend mainly on the closing and opening of the sphincter of Oddi. By the term sphincter of Oddi the author means only the circular ring of muscle fibers at the tip of the ampulla, not the entire ampulla. The wall of the ampulla itself is composed of oblique and longitudinal fibers in a thick layer. The gall bladder contracts by the action of smooth muscle fibers in the fundus and neck. The tone of the sphincter is influenced by several factors. It is increased by fasting alkalinity of the gastric contents and distention of the stomach and is decreased by feeding acidity of the gastric contents and the presence of magnesium sulphate in the stomach.

The liver secretes a thin watery bile continuously at a pressure which may rise to from 300 to 360 mm. of water. When the sphincter of Oddi is contracted the bile ducts fill, and when the pressure rises sufficiently the gall bladder begins to fill. The gall bladder concentrates the bile and receives more bile as the pressure falls to the level of that in the ducts. When meals are ingested regularly the gall bladder can hold all of the bile secreted in twenty four hours—from 500 to 1,300 c.c.m. When this amount is concentrated ten times it fills the gall bladder from one to three times. When the gall bladder is full the sphincter of Oddi relaxes, and bile flows into the duodenum this fact explaining the presence of bile in the duodenal contents in the fasting state and its absence two or three hours after a meal.

There is definite proof that the gall bladder contracts during the process of emptying. The physiological stimuli are the passage of food into the duo-

denum or after gastro-enterostomy into the Jejunum, and a small psychic response to the sight and smell of food. Among the substances which cause emptying of the gall bladder when ingested are egg yolk, fats, cream, milk, vegetables, oils, Witte's peptone, and magnesium sulphate. The hypodermic injection of pituitrin, histamin, and cholecystokinin causes emptying of the gall bladder. Under the influence of any of these stimuli the tone of the gall bladder wall increases and the sac rises, stiffens, and becomes oval instead of hanging flaccid in the shape of a pear. At times, the whole bladder contracts uniformly while at other times the fundus contracts to a greater degree than the rest of the organ. Contraction rings and other changes in the surface have been seen. During contraction the pressure rises to 330 mm. of bile and there is a decrease of the resistance of the sphincter. In animals, bile is seen to spurt from the papilla. In man, this phenomenon is exactly reproduced by the flow of bile from a duodenal tube. The expulsion of bile is sometimes associated with duodenal peristalsis, but the ampulla can work quite independently of the duodenal wall.

The law of the intestine suggested to Meltzer the possibility of reciprocal innervation of the ampulla and gall bladder. All experiments opposing the theory are open to criticism. Cholecystokinin can empty the gall bladder by way of the blood stream, and denervation experiments only confirm this effect without disproving the possibility of a double mechanism. Partial emptying of the over-distended gall bladder results from elastic recoil. Duodenal movements do not cause a flow of bile, and respiration and voluntary movements do not empty the gall bladder. These facts are easily understood when it is realized that changes in pressure must be common to all organs in the pressure cavity.

After cholecystectomy the extrahepatic ducts dilate whereas, in contradistinction to the changes occurring in malignant obstruction, the intrahepatic ducts are unaffected. The dilatation of the extrahepatic ducts is dependent on the sphincter of Oddi. If the latter is destroyed there is no dilatation. After cholecystectomy the flow of bile is altered, the bile dribbling away continuously instead of coming in spurts. Mann has suggested that in the human body the sphincter also dilates and becomes incontinent. In experimental studies the pressure in the bile ducts has been found to fall from the normal range of from 160 to 170 mm. to a range of from 30 to 60 mm. or even to zero. In animals without a gall bladder the flow of bile is a continuous trickle as in man and the dog after cholecystectomy. The significance of the lack of a gall bladder is unknown, but the fact that some animals have no gall bladder is no assurance that a human being is as well off without a gall bladder as with one.

NERVOUS AND PHARMACOLOGICAL STIMULI

The gall bladder, sphincter and ampulla are supplied with nerves from the vagus, mainly the left, and the splanchnic sympathetic. Cutting the sym-

pathetic fibers increases the slight rhythmic contraction which normally occurs two or three times a minute in the resting gall bladder (the tonic rhythm) by removing the inhibitory action of the sympathetics. Westphal related the strength of the stimulus with its effects and thereby cleared up the discrepancies in the results obtained by different workers. He showed that slight vagus stimulation contracts the gall bladder relaxes the sphincter of Oddi and causes peristalsis of the ampulla, whereas strong stimulation causes spasm of both the gall bladder and the ampulla and cessation of the bile flow. Stimulation of the sympathetic relaxes the gall bladder and ampulla and contracts the sphincter. These findings support the theory of reciprocal innervation of the extrahepatic biliary system.

The nervous mechanism seems to be supplemented by a humoral mechanism, as is so often the case in smooth muscle. The humoral factor is cholecystokinin, a substance of unknown composition which is related to secretin and is produced by the action of acid on the mucosa of the duodenum and jejunum. Carefully controlled experiments by Ivy and his co-workers, who discovered cholecystokinin, seem to have proved the presence of this mechanism beyond doubt, crossed-circulation experiments having eliminated the possibility of nervous stimuli. The significance of the following facts in relation to the cholecystokinin mechanism is unknown.

1. Olive oil given by duodenal tube causes a flow of bile although it is thought to be incapable of liberating cholecystokinin.

2. The duodenal contents are often highly acid without causing a flow of bile.

3. Although hydrochloric acid in the duodenum is thought to be the effective stimulus for the production of cholecystokinin in experimentally produced duodenal achlorhydria the gall bladder empties normally.

In the investigations of gall bladder function is man cholecystography and duodenal intubation with the injection of olive oil were the methods employed. In duodenal intubation the administration of 20 c.cm. of hot olive oil is followed in a few minutes by a flow of "A" or bile-duct bile. Suddenly there is a flow of darker "B" bile. When, during this phase, $\frac{1}{16}$ gr. of pilocarpin is injected intravenously to stimulate the vagus the flow of "B" bile continues for from ten to fifteen minutes. The bile then again becomes lighter ("C" or hepatic bile). The gall bladder is not emptied by 20 c.cm. of oil. On completion of the test the tube is washed out by injecting 50 c.cm. of hot water to prevent a bitter taste and the patient pulls the tube out himself.

DISORDERS OF MOTILITY

In cases of both normal and abnormal persons the intravenous injection of pilocarpin is followed by a preliminary sympathetic phase with tachycardia, a rise in the blood pressure, and flushing of the face, followed by a vagal phase with sweating, intestinal borborygmi, slowing of the pulse, and salivation, or

causes simultaneous tachycardia, sweating, and salivation. In the latter case the effect on the biliary system is that of vagal stimulation. During the vagal phase all normal subjects show an immediate increase in the rate of bile flow.

Biliary dyskinesia Aschoff and Berg conceived the possibility of a purely functional derangement with only secondary anatomical changes. "Adhesions" and inspissated bile unfortunately for many years provided a facile explanation for cases in which the cause of the disorder could not be determined. The subject of biliary dyskinesia was put on a sound basis by Westphal, who described cases in which the hypersensitivity of the vagus led to over-rapid emptying of the gall bladder or to spasm of the ampulla and complete cessation of bile flow—also cases in which there was a predominant sympathetic influence leading to relaxation of the gall bladder and ampulla and a spasm of the sphincter of Oddi which stopped the bile flow. Newman believes that these diseases are due to constitutional and acquired factors, the disturbed nervous mechanism constituting the final path by which the causes act. He states that any division of the dyskinesias into distinct entities is artificial as there is a continuous series of stages of departure from normality and the same case may show varying degrees of the process at different times.

The symptoms of biliary dyskinesia tend to be similar whatever the type because the pain is due to distention of the biliary tract and varies in degree rather than in kind. Cases of gall-stones symptoms without stones of cholecystitis in which the gall bladder is found normal at operation—hepatic neuralgia, and return of symptoms after cholecystectomy are cases of biliary dyskinesia. There is no pyrexia, and no occult blood is found in the stools.

Spastic distention The motor disorder which is most common and easiest to cure is spastic distention. This is more frequent in women than in men and most common at about the thirty-sixth year of age. It usually occurs in persons of heavy build who have a wide costal angle and broad shoulders, but are not fat. The author's patients not of this type were dyspeptics with a costal angle of about 90 degrees, narrow shoulders, powerful forearms and a tendency toward marked axillary sweating. All were active bodily and mentally and some of them described themselves as overstrung.

The chief complaints are a dull and grinding pain lasting for many minutes at a time and a constant soreness. The pain is in the tight upper quadrant of the abdomen. It spreads along the rib margins and becomes as severe in the left side as in the right. It tends to spread also through to the back particularly to the angle of the right scapula. It is often related to fatigue and exposure. It may come on an hour or two after meals or in the night, and may be temporarily relieved by food. Nausea is common. Occasionally vomiting occurs with relief of the pain. A history of slight flatulence may be elicited. The appetite is poor and loss of weight is usual. Some-

times the loss of weight is marked. The patient may look well or very ill. Subicterus has been reported. The bowels usually move more than once a day but constipation may be present and the ascending colon may be hard and tender.

The tongue is clean but may be pale or flabby. There is tenderness over the liver but no rigidity or catch in the breath on inspiration during palpation of the gall bladder area. In many cases examination reveals extrasystoles which are not usual in normal persons of the same average age. Cholecystography discloses only a delay in emptying. Roentgenographic examination of the stomach shows it to be small, horn shaped, and tonic, and to empty rapidly or with delay due to pylorospasm. The hydrochloric acid content of the gastric juice is normal or excessive. The manometer shows powerful and frequent peristaltic waves but small respiratory fluctuations. On duodenal intubation oil excites a good flow of bile after from fifteen to thirty minutes. Philocarpin causes an initial cessation of the flow for five minutes or less, and then a marked increase in the rate as the general symptoms pass off.

The history is as important as the results of intubation. The clinical picture of spastic distention is due to overfilling of the extrahepatic biliary system from defective emptying, the expulsion of bile being prevented by spasm of the vagus-innervated ampulla. The gastric and colonic activity and the cardiac signs are also such as could be caused by overactivity of the vagus-innervated structures.

The treatment of spastic distention is dietetic and medical. The patient should eat small, equal and regular meals free from coarse, irritating food, and should avoid taking mixtures of fats and starches. Simple and adequate food is advisable. An ounce of olive oil, cream, or butter taken at night will replace the fats lost in the diet. The medical treatment should consist of the administration of belladonna in doses of 10 minims three times a day after meals given in a mixture of 15 gr. of sodium bicarbonate to neutralize the excessive acidity and with infusion of rhubarb as a base.

Atonic distention Only four cases of atonic distention have been seen by Newman. The patients were older than those with spastic distention and of a different type being slim, with narrow costal angles, sloping shoulders and poor muscular development. The pain in this condition is a continuous, heaving, aching sensation. It comes on soon after meals and radiates all over the epigastrium. It is most severe in the gall-bladder area, but does not radiate through to the back. Other symptoms are anorexia, constipation, flatulence, and occasional vomiting. In contrast to the spastic type of distention, in which nausea is probably due to pylorospasm, there is very little nausea. The epigastrium and liver regions are tender. The stomach is atonic and baggy. It shows delayed emptying, contains little acid and often is free from hydrochloric acid. The gastric pressure is low and without peristaltic waves, but with a wide respiratory fluctuation.

Cholecystography shows a long thin gall bladder which throws a poor shadow and empties only slightly. The duodenal fluid contains escaped bile, but the injection of oil evokes a flow of bile only after a long delay. Pilocarpin increases the flow immediately. The bile ducts show little, if any dilatation, and the ampulla is not hypertrophied.

The treatment of atonic distention is not nearly so effective as that of spastic dilatation. The patient should be encouraged to eat fruits and salads. The meals should be dry. Green and root vegetables, cheese, milk puddings, and all doughy or sodden foods should be avoided. Tasty and appetizing food is advisable. In other respects the diet indicated is the same as that for spastic distention including the oil at night. Medicinally we lack a drug which is a sympathetic depressor or vagus stimulant. *Spiritus armoricæ comp* (homœopath) in a dose of 1 dr is useful to stimulate gastro-intestinal motility. Oil of peppermint (from 1/2 to 1 m.) and menthol in 1-gr pills are helpful, but other cruminals are not of much use. For the hypochlorhydria acid after meals seems to stimulate the biliary system better than the alkali given before meals. Dehydrochloric acid and the German homœopathic remedy tincture of sea thistle, are under investigation. Vinegar pickles, and acid drinks have been suggested by Brooke.

In interpreting these two major types of motor disorder it is important to realize that the gall bladder disorder is related to disorder of other muscular organs—the heart, stomach and colon—which have a similar innervation. Just as the gall bladder is part of the extrahepatic biliary system which acts as a whole, so also dyskinesia of that system is a part of dyskinesias of many organs. In discussing theories based on such factors as thickening of the bile, structural changes, constipation, and sedentary occupations, Frigyd says that the theory of neuromotor dyskinesia has made all others pointless.

The relations between the extrahepatic biliary system and other diseased organs are of interest from the points of view of both the differential diagnosis and the pathology of cholecystitis and cholelithiasis. The stomach both affects and is affected by the gall bladder (gastric and duodenal ulcers may cause a reflex over-activity of the biliary system as well as of the alimentary canal. This applies also to appendicitis and other organic diseases. In such cases the biliary dyskinesia is not likely to be diagnosed, but treatment of the primary cause cures the reflex disorders.

Inflammation of the duodenum is the probable cause of one type of so-called catarrhal jaundice. Cholecystitis may lead to hypertrophy of the ampulla muscle and asthma has been said to be associated with spasm of the ampulla. Symptoms of gall stones commonly begin in relation to pregnancy and "menstrual jaundice" has been known for over sixty years. It has been claimed that during every pregnancy and menstrual period there is excessive irritation of the biliary apparatus which often leads to some degree of spastic distention and biliary

dyskinesia is advanced as a possible explanation of the greater frequency of gall stones in women than in men.

The relation of gall-bladder and heart disorders is of interest as early coronary occlusion often produces the typical picture of and is diagnosed as, disease of the gall bladder. The converse error is less frequent. In the differential diagnosis it is of aid to remember that overactive persons likely to have spastic distention are liable also to high blood pressure. Careful consideration of the history of the pain is essential. It is important to know especially whether the pain came on suddenly during exertion, like angina or gradually after exercise like the pain of biliary dyskinesia. Residual tenderness lasts for hours after an attack of angina and for days after gall-bladder disease. Another aspect of the relationship between the heart and gall bladder is the production of true cardiac disorders by gall bladder disease. These include extrasystoles and sinus arrhythmia related to spastic distention, and experimentally asystole and sinus bradycardia in response to a sudden alteration of the pressure in the gall bladder produced by a vagal reflex which can be abolished by atropine and section of the vagus. Auricular fibrillation caused by cholecystitis has been reported.

A rhinopharyngeal syndrome of dryness of the pharynx, dry cough and dysphagia associated with biliary dyskinesia has been reported. One of the author's patients with spastic distention sought relief from symptoms which at first were thought to indicate tuberculosis of the larynx.

After cholecystectomy an unhealing fistula may result if there is spasm of the ampulla. Return of pain after the operation may also be due to biliary dyskinesia.

As Aschoff has stated, biliary dyskinesia is probably due to a group of conditions acting together. The Germans report its occurrence at an earlier age than that at which it usually occurs in England. In the cases of older persons, mental and physical stress, irregular and hurried meals and other types of overstimulation seem to favor spastic distention. Unappetizing sodden food, mixtures of fats and starches, and either very hot or very cold drinks at meals lead to atony of the stomach, biliary system, and colon. None of Newman's patients was hysterical, and the neurones and neurosthenia had no relation to dyskinesia. None of the patients had occipital headaches, pressure in the vertex, tachycardia, precordial pain, or fears, and Newman sees no reason for ascribing menopausal symptoms to gall-bladder disease.

ABNORMALITIES OF CONCENTRATION AND SECRETION

Because of the difficulty in obtaining exact information regarding the constituents of normal bile much is unknown concerning the abnormality of concentration and secretion in the gall bladder.

Cholesterol and bile salts. Cholesterol and bile salts are treated peculiarly by an inflamed gall bladder

The bile salts alone are absorbed, instead of the bile salts-cholesterol compound. The cholesterol is left behind and precipitates, obviously therefore constituting an important factor in stone formation. The normal ratio of bile salt to cholesterol is 18, whereas in cases of faceted (inflammatory) stones the ratio is 2.5. In pigment-calcium stones the ratio is normal. These facts are adequate evidence of the inflammatory origin of faceted stones and the non-inflammatory origin of pigment-calcium stones. The small amount of cholesterol secreted by the inflamed gall bladder is not important in the formation of stones.

Bilirubin. On standing bilirubin is partly oxidized to biliverdin and partly precipitated in characteristic crystals, having all the physical and chemical properties of that form of bilirubin which gives the delayed van den Bergh reaction (the haemobilirubin of Harrison). These crystals are seen in postmortem bile and are present in large numbers in cases of haemochromatosis pigment-calcium stone and atonic distention. They may form the starting point for the formation of pigment-calcium stones. Westphal's theory of precipitation due to high concentration of bilirubin has more experimental support than Schniede's theory that precipitation is started by the falling out of heavy metals, especially copper.

Protein. Protein is secreted into the gall bladder only as the result of inflammation and is of great importance in gall-stone formation. The faceted stones are built on a radially arranged protein ground structure with which the calcium is mixed in increasing proportion as development progresses, there being less protein toward the periphery.

Calcium. Calcium is sometimes present as a thick emulsion of calcium carbonate, particularly when there is obstruction of the cystic duct. It is secreted by the wall, probably as the result of infection and is present in the various types of "calcium micro-liths" which superficially resemble gall stones. The organized nucleus of a gall stone is many times the size of a microolith and has no similarity to it.

Fatty acids. Fatty acids are a normal constituent of gall-bladder bile and are found as amorphous sediments which are erroneously thought to be composed of other substances and to have a relation to stone formation. They are of no significance.

RELATION OF DYSKINESIA TO OTHER DISEASE PROCESSES

Stasis. Stasis is a term which has been used as a pathological explanation of gall bladder diseases. Newman abandons this vague term for standstill, a term meaning a condition occurring when there is neither inflow nor outflow of bile, as is the case when the cystic duct is ligated. The German 'Stauung' for which Newman uses 'distention' is an intermittent obstruction to outflow without a corresponding restriction of inflow. In this condition (spastic distention) bile cannot flow out of the extrahepatic system, but can flow into the gall bladder and its inflow is repeated as soon as concentration of bile in

the gall bladder allows room for more bile to enter. When concentration reaches its limit a condition of standstill results.

Distention is physiological between meals and in fasting and becomes pathological only when it is due to other causes or when it lasts too long. Its result is concentration of the bile which is pathological only when standstill occurs. It is of no importance in gall stone formation as the precipitates formed by simple concentration are resolvable in fresh liver bile whereas gall stones are insoluble in hepatic bile. Therefore if the gall bladder empties even infrequently it is improbable that concentration is of any significance even in the pathogenesis of conditions other than gall stone formation. When irreversible precipitation takes place the secreted bile is abnormal as in the inflamed gall bladder and the important factor is not the distention but the other factor.

Standstill results from continued distention by complete obstruction or by peritonitis. One gall bladder full of bile is retained without loss or addition through the duct. It is certain that bydrops or cholecystitis may result. It is commonly stated that standstill is a primary factor in stone formation and the mechanism is explained by two theories: (1) that standstill leads to decomposition of the bile and (2) that but for standstill cells cell debris and minute stone nuclei would be washed away and have no opportunity to develop into stones. These theories are discussed in detail. Newman concludes that the concept of stasis as a factor in the formation of stones must be abandoned. Therefore he does not discuss corsets, constipation, sedentary habits or other factors which have long been held to be important. Standstill remains a condition for the spontaneous change of cholebilirubin to haemobilirubin and its precipitation and may therefore be a factor in the causation of those pigment-calcium stones which are not due to excessive secretion of bilirubin by the liver.

Cholecystitis. Because of the use of stasis as an explanation for the cause of cholecystitis, the author discusses the relation of cholecystitis to dyskinesia. Ligation of the cystic duct causes cholecystitis, but ligation of the common duct does not. The neuromuscular dyskinesias depend on abnormality of the ampulla or sphincter and therefore correspond to ligation of the common duct. However it is possible that standstill may be an important factor in some cases of cholecystitis. This is suggested by two facts: (1) that symptoms of dykinetic origin may persist after cholecystectomy performed because of cholecystitis and (2) that the crypts of Luschka are altered in dykinetic states and then act as a portal of entry for the infecting organisms into the gall bladder wall. Cholecystitis can cause spastic distention, but in the production of cholecystitis, dyskinesia cannot yet be considered as more than a contributory factor.

Strawberry gall bladder. Strawberry gall bladder is the result of loading of the lining membranes with

lipoid droplets, some in the columnar cells, but most of them in histiocytes in the stroma of the folds. The process is one of absorption from the bile outward into the gall-bladder wall, and is probably the result of mild infection. The sequence would be infection, absorption of bile salts, precipitation of cholesterol and fatty acids to form a "lipoid mixture," and absorption of the lipoid by the lining cells. Two other possible causes discussed are metabolic and dyskinetic. Newman thinks they may contribute to the formation of strawberry gall bladder, but that in the main the condition is the result of mild cholecystitis. The disease is not important enough to warrant classification by itself.

Migraine Patients may be close to the truth when they speak of migraine as a bilious attack. Chirav and Pavel attribute it to dyskinesia, and state that it is greatly relieved by non-surgical drainage of the bile passages. In a case studied by Newman there was an increase of blood bilirubin and blood cholesterol during an attack with a fall to normal afterward. The gall bladder was stonic and distended, and the cholesterol content of the bile was low. These findings suggest hepatic insufficiency occurring intermittently and accompanied by migraine. The dyskinesia is not in itself the cause of the migraine because it is continuous, while the migraine occurs only occasionally. The question to be investigated is: Does the dyskinesia lead to the intermittent failure of liver function or are the abnormalities of the liver and biliary system the results of a common cause?

Gall stones Westphal regards biliary dyskinesia as the essential cause of gall stones, citing as proof stones of pinhead size produced by ligation-induced stasis of one hundred and seventy two days duration. Newman sets only a superficial resemblance to the faceted stone in the human being. The latter has many morphological and chemical criteria to which the experimental stones do not conform.

Dyskinesia has no relation to faceted, barrel, or raspberry stones. These are of inflammatory origin, as proved by Nannyn, Aschoff and others. Bilirubin-calcium stones which are found in the thin-walled ectatic gall bladders corresponding to stonk distention are probably due to the dyskinesia. The laminated type may be due to the same cause. Other stones of the same kind, found in hemochromatosis and alcoholic jaundice, are of metabolic origin. The soft white calcium carbonate stones result from cystic duct obstruction not of dyskinetic origin, while the hard, greenish stones contain much copper and are probably related to the metabolic pigment calcium stones. The cholesterol solitary is not related to dyskinesia. The formation of earthy stones in the common duct and round foreign bodies requires infection as a contributory factor and are probably not affected by dyskinesia.

Biliary dyskinesia is of clinical importance, offering an explanation of and suggesting treatment for cases unrelieved by the usual procedures, but it should not be loosely used as an explanation of other disease processes with which it has no connection.

E. S. PLATT, M.D.

GYNECOLOGY

UTERUS

Torda, E.: Statistical Investigation of Uterine Myoma. *Jap J Obst & Gynec* 1933 xvi 84.

This report is based on 441 cases of uterine myoma. The youngest subject was eighteen years old, and the oldest, seventy two. The average age was forty and nine tenths years. Forty-one and five tenths per cent of the patients were between forty and fifty years of age. 33.3 per cent were between thirty and forty and 11.7 per cent were between twenty and thirty.

Four hundred and nineteen (95 per cent) of the 441 women were married. Of these, 161 (38.7 per cent) were sterile and 286 (61 per cent) had been pregnant. Of the latter 33 per cent had had 1 child and 66 per cent had had more than 1 child. The average number of pregnancies was 3. The incidence of myoma in the pregnancies was only 0.48 per cent.

The frequency of the different types of myoma was as follows: interstitial, 54.9 per cent; subserous, 39.5 per cent; mixed, 3.4 per cent; interstitial subserous, 2.9 per cent; interstitial submucous, 0.4 per cent; and submucous, 2.4 per cent.

In the majority of the cases the myoma was in the corpus of the uterus. The incidence of cervical myoma was 9.6 per cent.

The youngest age of appearance of the menses was twelve years and six months and the oldest twenty years. The average age was fifteen and two tenths years. The youngest age of occurrence of the menopause was thirty-eight years, the oldest, fifty-two years and the average forty-seven and eight-tenths years.

The menstrual flow was profuse in 39.1 per cent of the cases, moderate in 51.2 per cent and small in 11.7 per cent. The duration of menstruation ranged from two days to fifteen days and averaged three and eight-tenths days.

Dysmenorrhea occurred in 56 per cent of the cases.

Metrorrhagia occurred in 91 (20.6 per cent) and menorrhagia in 26 (5.9 per cent).

Occasionally cancer was found complicating the myoma. As a rule the cancer was in the cervix.

In 16.1 per cent of the cases the myoma was accompanied by adnexal changes. In 9.5 per cent the changes were in the ovary and in 6.5 per cent in the fallopian tubes.

MAX C. ENRICH, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Goodall, J. R.: Some Aspects of Ovarian Dysfunction. *J Obst. & Gynec Brit Emp.*, 1933 xi, 640.

Before discussing ovarian dysfunction the author reviews the physiology of the ovaries and uterus.

He characterizes the development of the ovum and its liberation from the ovary as a true labor in which the membrana granulosa corresponds to the decidua vera, the reflected discus proligerus to the decidua reflexa and the basal portion below the egg to the decidua serotina. After the expulsion of the egg there remain portions of the membrana granulosa from which the corpus luteum is developed. The regressive changes about the corpus luteum have been shown to be similar in every respect to the changes that take place in the wall of the uterus after parturition. The developing ovum evokes two or more secretions: first a follicular secretion contained in the liquor of the follicle and second the luteal secretion. Disturbances in the interrelation of ovulation, follicle and lutein may take place with clinical consequences which are not always clearly understood.

The function of the ovaries is related most intimately to that of the anterior lobe of the pituitary gland, the thyroid gland, and the parathyroids. The anterior lobe of the pituitary gland is the motor or regulator of the ovary. It can act as a whip or a drag on ovarian function. The thyroid acts more intimately on the ovary and by direct corporeal cellular stimulation or inhibition. Thyroid insufficiency leads to ovarian insufficiency only incidentally and vice versa, and the bursts of cellular activity incident to puberty and pregnancy find a corresponding and synchronous awakening of thyroid elaboration. If the thyroid reserve is normal it will respond to the extra demands, but in families with glandular instability the response to excessive demands may lead to permanent over-activity or to enlargement followed by fatigue and permanent insufficiency. This is true also of the adrenals. Perfect health therefore requires a normal reserve in each gland. When the reserve is insufficient, neuroasthenia with variable syndromes is prone to develop. The syndromes may be cardiac, vasomotor, cerebral, pelvic, or locomotor. They may also be multiple.

Ovarian dysfunction is manifested by a disturbance of the normal rhythm of the menstrual phases, pain at menstruation, sterility and disturbance of the primary and secondary sex characters. Most of the errors that have brought endocrine treatment into disfavor have been due to a wrong interpretation of symptoms, an incorrect diagnosis or in sufficient knowledge of the attributes of the remedial agents. The difficulties of diagnosis are greatest in the cases of early glandular dysfunction but the results of treatment are best in these cases. The early states of ovarian dysfunction may be manifested by amenorrhea, menorrhagia or metrorrhagia.

In conclusion the author gives a brief review of the treatment of ovarian dysfunction with endocrine products.
HARRY W. FINE, M.D.

EXTERNAL GENITALIA

Delporte, F., and Cahen, J.: A Contribution to the Study of the Combined Radiological and Surgical Treatment of Epitheliomata of the Vagina and Urethra (Contribution à l'étude du traitement radio-chirurgical des épithéliomes de la vulve et de l'urètre). *J. de chir.* 1933, xii, 861.

In a period of ten years the authors have treated twenty five cases of vulvar carcinoma, including five cases with involvement of the urinary meatus or the urethra. A review of the literature shows clearly that a uniformly satisfactory method of treatment has not as yet been devised. Vulvar carcinomata are so malignant that surgical or radiological treatment alone has proved disappointing. However the primary neoplasm is usually quite radiosensitive and disappears under the action of radium. The chief obstacles to surgical or irradiation treatment are lymphatic extensions which do not respond so readily. Treatment is rendered difficult also by the rich lymphatic network in the involved region with its susceptibility to infection, the resistance of adenopathies, and the necessity of maintaining adequate function of the impaired urethra. The lymphatics of the vulva are described in detail. The irradiation of the tumor and of the lymphatics should preferably be performed at the same time. The combined radiological and surgical treatment recommended by the authors comprises the following procedures:

1. Simultaneous irradiation of the primary tumor and the inguinocrural lymphatics.
2. Total vulvectomy after cauterization of the vulvar lesions has occurred.
3. Removal of the lymph nodes on each side if they appear to be or are suspected to be involved. Because of the radical nature of the operation and the exposure of large surfaces, infection is frequent. However as the danger of recurrence is greatly decreased by the procedure the authors plan to use it more frequently in the future despite the risks of infection.

The radium is applied by means of needles containing 0.66 or 1.33 mgm. of radium element which are inserted at the borders of the neoplasm and into the tumor itself under local anesthesia. Small tumors require daily doses of from 1 to 2 mcd., and large neoplasms, daily doses of from 4 to 5 mcd. The duration of the treatment varies from four to ten days. Radium necroses do not develop if this dosage is not exceeded.

In carcinoma of the urethra treatment with radium needles is contra-indicated as traumatization of the urethra and fistula may result. The radium should be applied to the urethra by means of tubes containing 10 mgm. of radium element filtered with a 2-mm. gold-platinum filter and held against the anterior vaginal wall by a gauze pack in the vagina.

Two or three tubes are usually used, a total dosage of 216 mcd. being given at the rate of 3.6 mcd. daily over a period of six days.

The application of radium often results in complete macroscopic and microscopic disappearance of the neoplasm. When the lymph glands appear normal they are treated by deep X-ray therapy (4,000 r on each side) or by means of a belt containing 10-mgm. radium-element tubes 4 or 5 cm. apart and placed 4 or 5 cm. above the skin. This treatment is carried out over a period of eleven days, a total of 198 mcd. being given. Lymph nodes clinically invaded are treated in the same manner and are removed surgically six weeks after the irradiation if the patient's condition permits. In the opinion of the authors, radium irradiation is more efficient than deep X-ray irradiation. Adenopathies are more radioresistant than the primary tumors. When the lymph glands are adherent only X-ray or radium therapy is attempted as surgical treatment is useless and, because of the presence of infection, is seldom followed by healing. The prognosis is not improved by surgery at this stage.

Vulvectomy is performed as soon as cauterization has followed the application of radium. The technique is described in detail. Removal of the lymphatics is done later, when the patient has recovered from the effects of the vulvectomy. The author reviews the histories of twenty five patients, twenty four of whom have been under observation for more than one year. A permanent cure was obtained in seven (28 per cent).
HAROLD C. BLACK, M.D.

MISCELLANEOUS

Jayle, P. and Jayle, G. E.: The Pelvic Innervation in the Female. Anatomy and Histology (L'innervation pelvienne chez la femme). *Rev. franc. de gynéc. et obstet.*, 1933, xviii, 363.

The authors present a rather exhaustive report on the histology and anatomy of the nervous apparatus of the genital system of the female and conclude the article with a discussion of the pathology of the pain phenomenon.

The nervous apparatus of the female genital system is derived from two sources: (1) somatic branches from the lumbar sacral, pudendal and coccygeal plexuses; and (2) sympathetic branches from the pelvic visceral ganglia and the nerves of the abdominopelvic sympathetic system.

In discussing the medicosurgical anatomy of the somatic nerves of the genital system, the authors state that the pelvis and genital region receive their somatic nerve supply from the four plexuses mentioned in addition to posterior branches from the fifth and sixth sacral nerves. Because of their situation and ultimate distribution the pudendal and coccygeal plexuses are exclusively pelvipерineal. The lumbar plexus and the sacral plexus, destined essentially to innervate the lower extremities, furnish only accessory pelvipерineal branches. The formation and the ultimate distribution of each of these plex-

are shown by diagrams and are described in detail with particular emphasis on peripheral distribution and surgical accessibility.

The organovegetative or sympathetic nervous system of the female pelvis is composed of two bilateral elementary formations with different destinations which are relatively autonomous: (1) the tubovarian system which supplies the tubes and ovaries, and (2) the pelviperineal system, which supplies the pelvic organs and the perineum.

The authors discuss the formation and distribution of these systems, review the theories advanced to explain the histology of the afferent and efferent components, and call attention to the surgical accessibility of the sympathetic system.

To explain the mechanism of visceral pain in general, two theories have been presented: (1) the theory of Lennander according to which the viscera are insensitive, only the peritoneum is sensitive, and all pain within the peritoneal cavity is provoked by peritoneal irritation, and (2) the theory of Head and Ross, according to which pain termed protopathic pain which is provoked by direct excitation of the sympathetics contained in the viscera, occurs in addition to reflex pains which are referred to a cutaneous region.

On the basis of the findings of their anatomical studies the authors suggest the following clinical classification of the pains associated with lesions of the female genital system: (1) peritoneal pain, (2) visceral pain, (3) cellular pain, (4) pain from compression or direct or indirect irritation, and (5) central or psychic pain. They discuss each of these types separately and cite clinical and experimental evidence in support of the classification.

GEORGE C FINKOLA M.D.

Keller H. The Physiology of the Genital Nervous System in the Female (Physiologie du systeme nerveux genital chez la femme). *Rev. franc. de gynéc. et d'obst.*, 1933, xxviii, 449.

By means of a schematic drawing the author shows that the female genital system is innervated by the cerebrospinal nerves and the sympathetic nervous system. In describing the course of the nerves he calls attention to the nerve endings. The nerve endings are interspersed with groups of chromaffin cells which in both their physical and their chemical character resemble suprarenal cells. Together they form a network of neuroganglia which are especially abundant in the uterine musculature at the junction of the uterus with the broad ligaments, in the cervical sphincter, and in the deeper layers of the vaginal walls. The term pheochrome apparatus of the genital system has been applied to this network.

The types of irritation capable of stimulating uterine contraction are: (1) cutaneous excitation, (2) central and peripheral excitation, (3) excitation of the parietal and visceral peritoneum, (4) central and peripheral excitation of the vagus nerve, (5) excitation of the pelvic organs, intestines and bladder and

(6) direct excitation at any point along the genital tract itself. Proof of the action of each type is cited.

Following a review of the literature on the effect of the abolition of one or both sources of nerve supply to the genitalia, the author discusses the results of Canonne's experiment in which the eradication of both systems of uterine innervation had no deleterious effects on pregnancy, parturition, lactation or involution. From Canonne's findings authorities conclude that the uterus must possess an autonomic function of its own. Whether this function is due to the ganglia apparatus described or the activity of the muscle fiber cells proper is still unknown. The author believes that the ganglia apparatus is responsible. In support of his opinion he presents confirmatory experimental evidence and photomicrographs showing the so-called sensonary corpuscles.

In conclusion Keiffer suggests that the normal function of the pheochrome apparatus of the uterus is probably one source of painless contraction of the uterus, and that any anatomical or functional deviation of the apparatus may possibly explain a certain number of cases which otherwise could not be explained.

GEORGE C FINKOLA M.D.

Douay E. and Colanéri V. Abdominopelvic Pains (Les douleurs abdominopelviques). *Rev. franc. de gynéc. et d'obst.* 1933, xxviii, 483.

The authors divide gynecological pains into the following four types:

1. Acute abdominopelvic pains. These are usually associated with affections of the pelvic organs which frequently demand immediate operative interference such as extra-uterine pregnancy, twisted tumor pedicles, intestinal obstruction of pelvic origin, and generalized peritonitis of pelvic origin. The various aspects (mechanism, diagnostic value, onset, severity) of the pains in each of these conditions are discussed in detail.

2. Spontaneous abdominopelvic pains. These are characterized particularly by their rhythmic occurrence with the cycle of ovulation. Accordingly they are divided into the intermenstrual, premenstrual, menstrual and postmenstrual pains and secondary pains from involvement of neighboring organs such as the appendix. The intermenstrual pains are explained by the author on the basis of the congestion associated with ovulation which occasionally (in 5 per cent of cases according to Binet) becomes pathological. The premenstrual pains are attributed to a disturbance of function of the ovary. As a rule they are transient. Those which persist or recur repeatedly each month are attributed by the authors to sclerocystic ovaries. The mechanism, clinical findings, and medical and surgical treatment are discussed. The menstrual pains (dysmenorrhea) are explained by lesions of the genital organs, clots from functional bleeding, associated genital disease, stenosis of the cervix, or the effects of endocrine influences. The postmenstrual pains are believed by the authors to be due most frequently to inflammatory processes of the adnexa.

3. **Permanent pains.** Permanent pains are described as a dull ache or a sensation of heaviness or weight in the pelvis. They are usually continuous. From the clinical point of view they may be divided into those of inflammatory origin and those originating from pelvic congestion.

4. **Provoked pains.** These pains are provoked by palpation or manipulation. They are of great aid in establishing the diagnosis. A number of lesions along the genital tract in which pain may be elicited by palpation are discussed in detail.

GEORGE C. FETOLA, M.D.

Laffont, A. The Extrapelvic Pains in Gynecological Affections (Les douleurs extra-pelviennes dans les affections gynécologiques). *Rev. franç. de gynéc. et obs.* 1933 xxviii, 516

In the course of utero-adnexal affections it is not uncommon for pain to occur at a considerable distance from the original lesion in the pelvis. The most frequent locations of such pain are the thoracic, the scapulohumeral, and the cervicoincinal regions. Pain of this type has been designated as "elevated" or "referred" pain. It may be a manifestation of one or the other of the following types of sympathetic reflexes:

1. **Dermalgias** analogous to the visceral dermatomes described by Head, which are characterized by a superficial localization such as the surface of the body over the scapular, thoracic, nuchal, or brachial region.

2. **Visceralgias**, which are characterized by their deep localization over the thoracic or upper abdominal viscera. These pains may be so pronounced as to lead to an erroneous diagnosis. Some authorities have gone so far as to say that all women presenting themselves with pain in the upper part of the abdomen should be subjected to a vaginal examination. Localization of the so-called referred pains may occur over the organs named on the same or the opposite side.

A classical example of the referred pain described is the referred pain of ruptured ectopic pregnancy which may occur in any of the sites mentioned. For the latter there are two routes of conduction: (1) a cerebrospinal route from subdiaphragmatic innervations, and (2) a sympathetic route from spills limited to the pelvis.

In subdiaphragmatic or peritoneal inundations the referred pain is due to irritation of the diaphragm by blood or gas (tubal insufflation) which has found its way to the subdiaphragmatic region. As the phrenic nerve, especially on the right side, gives off branches to the subdiaphragmatic peritoneum, any irritation of these fibers is conducted along its course to its common origin with the subclavicular and subacromial branches of the superficial cervical plexus and is transmitted to areas innervated by the latter.

Thoracic pain due to spills limited to the uterus is a reflex pain from peritoneal irritation of the de-sac of Douglas which is conducted through

hypogastric plexus and presacral nerves by way of the solar plexus to the cord and thence to the intercostal nerves.

A third route of conduction in cases of adnexal lesions without spill has been the cause of considerable controversy in the literature with regard to the pathogenesis of referred pain. Lennander believes that in cases in which the lesions are limited to the viscera alone, the stimulus occurs by way of the root nerves innervating the viscera whereas Lemaire is of the opinion that, as the sympathetics supply the visceral peritoneum as well as the parietal peritoneum, the stimulus is a sympathetic stimulus through the visceral peritoneum. The author believes that distention due to encapsulated or intracystic hemorrhage or inflammatory processes plays a dominant rôle in the causation of this pain. Stanca has reported cases of shoulder pain following ligation of the tubes for sterilization.

GEORGE C. FETOLA, M.D.

Zimmerman, A., Netter, L., and Pecker, A.: Physiotherapy of Pain in Gynecology (Physiothérapie de la douleur en gynécologie). *Rev. franç. de gynéc. et obs.* 1933 xxviii, 507

The authors discuss the present status of physiotherapy in the treatment of gynecological pain. Physiotherapy and kinesitherapy (massage and gymnastic exercises) are distinctly beneficial in chronic and subacute cases and of value to a less extent in acute cases.

The galvanic and faradic currents, diathermy infrared light, ultraviolet light, X-rays, radium, and emanotherapy are discussed, and the technique of their application is described in detail. The high-frequency current is the most precise physiotherapeutic agent for the treatment of gynecological aches and pains.

The effects of physiotherapy in different types of gynecological conditions are summarized as follows:

1. **Diseases of the vulva.** Pruritis of unknown cause has been successfully treated by superficial radiotherapy and vaginitis of unknown cause by faradism.

2. **Diseases of the uterus.** Obstructive dysmenorrhea has yielded to electrolytic dilatation, embolization, to diathermocongelation and the bleeding associated with fibroids, to curietherapy. Radium finds its chief indication in uterine carcinoma.

3. **Diseases of the adnexa.** Salpingo-oophoritis responds well to hyperpyrexia. Therefore any agent capable of increasing the local temperature may be of value in its treatment.

The relief of pain by kinesitherapy (massage) has been attributed to (1) relief of congestion by active dilatation of the blood and lymphatic vessels, (2) the mechanical correction of minor displacements, and (3) a direct action on the sympathetics which diminishes the hyperexcitability of these nerves.

The contraindications for massage are old chronic infections accompanied by pain, postoperative cellulitis, and pelvic

meninges. The contra-indications are almost absolute. They are malignant tumors, recent blood clots, acute pelvic and generalized peritonitis, engorged pps, benign liquid tumors which cannot be evacuated (dermoids) and torsion and tuberculosis of the adnexa.

The technique of various types of massage is described. In the authors' opinion, the bimanual methods are best.

In some cases treatment by posture is of value.

GEORGE C. FRYOLA, M.D.

PILL, G.: Retroperitoneal and Mesenteric Tumors in Gynecology (Retroperitoneale und mesenteriale Geschwülste in der Frauenheilkunde) *Orvosi hetil.*, 1933, p. 27.

The author operated upon three cases of retroperitoneal tumor. In two cases a diagnosis of ovarian tumor was made although a retroperitoneal tumor was suggested. In one case the tumor was discovered five weeks after delivery. It had been infected by the house physician who punctured it several times during the delivery. The three tumors were respectively an enterocystoma, an endothelial cyst, and a myxolipoma. They were all removed by laparotomy and the patients recovered. The opera-

tions were performed respectively under pernocton ether anesthesia, local anesthesia, and spinal anesthesia. The myxolipoma was of enormous size and weighed 10 kgm.

The pathology and diagnosis of such tumors are discussed. Retroperitoneal tumors occur twice as often in women as in men. Surprising are the cachectic appearance of the patients and the tendency of the tumors to recur in spite of their histologically benign appearance. Gastric and urinary tract disturbances are common because of pressure. The tumors are only slightly mobile, and as a rule the colon can be felt over them. In spite of these characteristics the tumors are easily confused with ovarian and renal neoplasms and the correct diagnosis is often not made until laparotomy is performed. The diagnosis is still further complicated if the growth suppurates, undergoes necrosis or is infiltrated by hemorrhage.

The only treatment is operation. This is very difficult and has a mortality of 7 or 8 per cent. In the removal of the tumor the large vessels, ureters and sympathetic nerve are endangered. Because of the severity of the operation and the length of time it requires local or spinal anesthesia is preferable to general anesthesia.

FELIX GIL (G)

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Bishop P M F The Friedman Test for Pregnancy *Gyn Hosp Rep Lond* 1933, LXIII, 303

Blashop analyzes the results of a year's experience with the Friedman test for pregnancy and suggests a modification of this test

The biological tests for pregnancy provide a means of diagnosing pregnancy with certainty as early as a month after conception They are therefore of special value in diseases, such as advanced tuberculosis in which pregnancy is contra-indicated and its termination is justifiable They facilitate the differential diagnosis between pelvic tumors and early pregnancy and between a ruptured extra-uterine gestation and other varieties of pelvic tumor and they confirm the diagnosis of hydatiform mole and chorionepithelioma

Methods of diagnosing pregnancy which are based on changes in the generative tract of laboratory animals were first introduced by Aschheim and Zondek These tests show the dependence of the ovary on the secretion of a hormone from the anterior lobe of the pituitary body and the presence of this hormone in the blood and urine of pregnant women

In the Aschheim-Zondek test early morning urine is injected subcutaneously into immature female mice in 6 doses of 0.4 c.c. each The injections are given twice daily and the animals killed one hundred hours after the first injection The reactions obtained are as follows

1. Maturation of the follicles and ovulation associated with hyperemia of the tubular tract
2. Hemorrhage into enlarged follicles, or corpora hemorrhagica
3. The formation of normal corpora lutea or of corpora lutea atretica in which the unfertilized ovum is found embedded in luteal tissue

In 2,368 cases reported by 13 observers, Robertson found the incidence of error of the Aschheim-Zondek test to be 1.47 per cent

The Siddall test is based upon the increase in weight of the genital tract produced by the action of oestrin. Twenty five cubic centimeters of the patient's blood are withdrawn from a vein and 1 c.c. of the supernatant serum is injected into each of 3 immature female white mice daily for four or five days or until oestrus has been induced, as shown by vaginal smears. The mice are killed on the following day and the uterus and ovaries weighed on a delicate scale. The most obvious drawback to this test is the necessity of obtaining blood from the patient The Siddall test has all of the disadvantages of the Aschheim-Zondek test without the accuracy of the latter In 364 cases Mazer obtained false negative reactions

in 24 per cent and false positive reactions in 17 per cent

The oestrin test of Mazer and Hoffman depends on the production of oestrus in castrated female mice by the injection of the urine of the pregnant woman. Oestrus can be detected by the vaginal technique of Allen and Doley The results show this test to be less sensitive than the Aschheim-Zondek and Friedman tests Mazer obtained false negative results in 25 per cent of 250 cases of pregnancy and false positive results in 25 per cent of 280 cases in which pregnancy was absent

In 1931 Friedman and Lapham modified the Aschheim Zondek test, using rabbits as the test animals. As the effect usually occurs within twenty-four hours, a result may be obtained much more rapidly in the case of the Friedman test.

Of the 4 pregnancy tests, the Siddall test seems to be the least accurate The Aschheim-Zondek test, when carried out skillfully is remarkably accurate, but occasionally gives a false result because of excessive secretion of prolactin in the urine at the menopause and in other conditions not associated with pregnancy The Siddall test is the least practical of the tests The Friedman test is the most practical as it requires only 1 sexually mature rabbit whereas the other tests require colonies of mice. In the Friedman test only 1 or 2 urine injections are necessary Ten cubic centimeters of urine are injected into the marginal ear vein of the rabbit. The presence of corpora hemorrhagica in the ovaries indicates a positive reaction

In experimental studies of the various tests for pregnancy the Friedman test was carried out by three methods. The third method was designed to exclude the sources of error of the first method. It was exactly the same as the first except that a preliminary laparotomy was performed in order to prove the absence of corpora hemorrhagica before the injection of urine. In the entire series of tests there were no incorrect results.

The active principle in the urine on which the Friedman test is based remains potent for at least six days after the urine has been voided.

The Friedman test is positive as early as twenty-one days after conception and becomes negative between forty-two and forty-eight hours after parturition.

The blood from the umbilical cord does not give a positive reaction.

In the rabbit, mechanical stimulation of the uterine cervix tends to produce fresh corpora lutea whereas injection of the urine of pregnancy almost invariably produces corpora hemorrhagica.

Cerebrospinal fluid obtained from a pregnant woman does not produce a positive reaction.

In a case of chorionepithelioma the equivalent of 1/300 c.c.m. of urine may produce a positive reaction. When a pregnant rabbit is used as the test animal the result may be relied upon if it is positive, but the test should be repeated if the result is negative.

In cases of pituitary disorder the urine may contain an excess of prolactin. MAX C. ENRICH, M.D.

Bernhard, E.: The Increase of Tubal Pregnancy and Its Causes. (Ueber die Zunahme der Tubar graviditt und ihre Ursachen.) *Ztschr f Gbnaristik u Gynk* 1933 cv 46

The author reviews more than 750 cases of tubal pregnancy which were treated at the gynecological and surgical clinics of Basel in the period from 1896 to 1930, inclusive.

The absolute increase of tubal pregnancy after 1896 was about fourfold. However it is necessary to compare this increase with the census figures. As the rural population is divided into many small districts and therefore cannot be easily included in the figures from the city clinics the author discusses only the cases of patients coming from the city districts. It is interesting to note that up to 1905 about 50 per cent of all cases of tubal pregnancy were given conservative treatment, and that during this fifteen year period only 4 patients died and these had been subjected to operation.

It cannot be denied that improved diagnosis accounts for some of the increase in the number of cases of tubal pregnancy. Even today the cause of the condition is often obscure although the incidence of unexplained cases has been decreased from about 50 to about 20 per cent. That the increase of tubal pregnancy cannot be ascribed merely to the increase in the population is demonstrated by a graph which shows the increase of tubal pregnancy by an irregularly jagged curve and the increase in the population by a flat curve tending down toward the zero line.

The author discusses the individual causes of tubal pregnancy to determine the reason for the increase. He concludes that the increase is due, not to a single cause, but to a multiplicity of causes. Of chief importance are the increase of morbidity due to gonorrhea and the greater frequency of abortion. Other important factors are the increase in the use of contraceptive methods and the increase in the incidence of common inflammatory processes including chronic appendicitis. Benign and malignant tumors of the tubes, tuberculous salpingitis, hypoplasia of the genitalia and neuroses of the sympathetic system may lead to tubal pregnancy but have no relation to the increase of the condition. FROMMOLT (G)

LABOR AND ITS COMPLICATIONS

Blair Bell, W., Datnow M. M. and Jefferson T. N. A.: The Mechanism of Uterine Action and Its Disorders. *J Obst & Gynec Brit Emp* 1933, xl, 547

The authors review the theories of the mechanism of uterine action and its disorders from ancient times

up to the present. Hippocrates' assumption that the fetus leaves the uterus because of an insufficiency of nutriment cannot today be deemed wide of the mark. Brown Squard who appears to have been the first to perform experimental work on the subject, concluded that the uterine musculature in animals becomes more irritable as pregnancy progresses and that labor is initiated by an excess of carbon dioxide in the maternal blood. The present century will go down in history as the era of the demonstration of the internal secretions and their relation to the onset of labor. The authors have classified the factors concerned in the contraction of uterine muscle and the disorders related thereto. The general conditions associated with and governing normal uterine contractions are considered including the anatomy and physiology of the musculature, the innervation of the uterus and the constituents of the blood.

The determination of pregnancy and the onset of labor appear to be related to factors which may be described as predisposing and exciting the former representing the changed fetal requirements and the related changes in the placenta and fetal excretions and the latter the factors which excite or precipitate expulsive contractions of the uterine musculature in order that the physiological demands of the fetus may be met by a change in its environment. There are two possible aspects of this relationship namely the mechanical and the chemical. From the mechanical aspect it is evident that at term the fetus with its membranes having lost some of its symbiotic affinities may resemble a foreign body or an intra uterine polyp which undergoes extrusion and possibly expulsion even though its vascular connections are not at first severed. The predisposing chemical disturbances at term may represent either the removal of a fetal inhibitory hormone or the elaboration by the fetus of an agent sensitizing or stimulating uterine contractions. Therefore the factors which terminate intra uterine life, though indefinite, are certainly related to the nutrimental needs of the growing child as was postulated by Hippocrates.

The experimental methods are described.

The conclusions drawn with regard to the ovarian secretions are as follows:

1. The hormone of the corpus luteum (progesterin) inhibits the activity of uterine muscle and leads to changes in the endometrium and possibly also in the vaginal secretion, menstruation, and gestation. In most animals in which a true placental attachment occurs the yellow body appears to be required for the continuance of pregnancy until a late period but in the human subject it is necessary for only a few weeks.

2. Hormones of the anterior lobe of the pituitary gland assist and may even replace progesterin in inhibiting the motility of the uterine musculature during pregnancy.

3. The follicular hormone (oestrin folliculin) in pure form has no effect on the isolated uterus and no

Immediate action on the uterus *in vivo*. Similar negative results were obtained with Antuitrin S.

4. Estrin produces its effects on the uterine musculature, especially in pregnancy, in three ways: (a) by causing hypertrophy of the muscle fibers, (b) by sensitizing the muscle of nerve elements and (c) by stimulating the production of infundibulin.

The supposed reproductive hormones of the anterior lobe of the pituitary gland which are obtained from the urine of pregnant women are discussed and their effects described.

The action of the hormones of the posterior lobe of the pituitary gland (infundibulin) are discussed with regard to the possibility of sensitization and the normal responses of the uterine musculature. The question as to whether or not infundibulin is rapidly excreted or destroyed is considered.

The actions on uterine muscle of the separate fractions of infundibulin—vasopressin and oxytocin—are shown not to correspond to those implied by the respective names of the fractions. On the uterus of the guinea pig *in vivo* and *in vitro* pituitrin itself was found to have a greater tonic effect than either of its fractions, and pitressin was found to have a stimulating effect which is almost as great as that of pitocin.

Experiments showing the effect of calcium, potassium, and magnesium on the activity of uterine muscle are described. Calcium salts in an optimum amount are essential for uterine motility. Magnesium salts inhibit uterine activity.

Evidence is adduced to show that the onset of labor is associated with an excess of estrin in the maternal circulation.

The clinical application of the experimental findings are discussed briefly in relation to:

1. Abortion, in which the presence of an excess of estrin is of diagnostic and prognostic importance.
2. Premature and postmature labor
3. Precipitate labor
4. Involution
5. Pathological uterine inertia. It is suggested that in the absence of pathological lesions in the uterus this condition is due to insufficiency of pressor substances, such as infundibulin and calcium salts, in the maternal blood. Uterine inertia is associated with a reduced blood pressure.
6. Tonic contraction. The view is expressed that when there is an optimum or an excessive amount of pressor substances in the maternal blood stream in cases of obstruction to the progress of labor which cannot be overcome the contractions may become tetanic in nature.

HARRY W. FOX, M.D.

Van Rooy A. H. M. J.: An Investigation on Dry Labor. *J. Obst. & Gynec. Brit. Emp.* 1933, 30, 850.

In a review of 15,843 cases of childbirth on the Obstetrical Service of the University of Amsterdam in the period from 1921 to 1931 the author found that the membranes ruptured spontaneously before the beginning of labor in 0.83 per cent of the primipare and 1.25 per cent of the multipare. If the

conception of dry labor is extended to include cases of spontaneous rupture of the membranes before the beginning of labor pains and before dilatation reached 3 or 4 cm. the frequency of dry labor was 0.30 per cent.

In the cases of dry labor the labor was definitely prolonged, chiefly in the cases of primipare. Artificial aid was necessary more frequently but contracted pelvis, which was present in fully half the cases, was partly responsible. The maternal mortality showed no change, but the fetal mortality was increased especially when artificial aid was necessary. The maternal morbidity was increased only slightly chiefly in cases in which artificial aid was instituted.

The author concludes that dry labor is an unfavorable complication, and that artificial aid and premature interference endanger the life of the child.

HAROLD AL. BRILL, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Stafaschik, S.: Extragenital Metastases in Puerperal Fever (Die extragenitalen Metastasen bei Puerperalfieber). *Gewiss. heilw.*, 1932, p. 1057.

In the clinical course of puerperal sepsis the appearance of metastases usually signifies a very unfavorable turning point. In the material of the First Gynecological Clinic of Vienna for the last ten years the author found eighteen cases in which extragenital metastases were demonstrated and the patient succumbed to the infection. In the majority of the cases the metastases occurred in several organs simultaneously and were not recognized at all or were recognized only in part during life. In most instances the lungs were special sites of the secondary bacterial localization. Autopsy disclosed lung abscesses in ten cases. The frequency of pulmonary involvement is explained by the anatomical conditions, as thrombi lodged in the vena cava are disseminated by the venous and lymphatic circulation. From the infarct formed in this way a lung abscess is formed when pathogenic bacteria are present. Ultimately the bacteria reach the left ventricle by way of the pulmonary vein and enter the general circulation. As a further consequence, abscess formation occurs in the other vital organs. Of the infected thrombi which entered the general circulation primarily seven lodged in the kidneys and two in the spleen. Obviously in these cases also there was a combination of metastases in various organs. Altogether autopsy disclosed combined metastases in sixteen cases. In only two were the extragenital metastases limited to a single organ, namely the lung.

On account of the difficulties in the diagnosis of extragenital metastases the author believes that in every definitely established case of puerperal sepsis a thorough daily examination should be made with special regard to skin exanthemata and changes in the vital organs, as only by such careful examinations will it be possible to determine the presence of

metastases which have not caused subjective symptoms. From the standpoint of therapy the early recognition of such metastases is of extreme importance.

E. GOLDBERGER (G)

MISCELLANEOUS

Rosenstein, W. The Significance of the Aschheim Zondek Reaction in the Indications for Treatment Following Hydatid Mole (Die Bedeutung der Aschheim Zondekschen Reaktion fuer die Indikationsstellung nach Blasenmole) *Arch f Gynaek.*, 1933 cil, 370.

The author reports on a case of chorionepithelioma following a hydatid mole in which the Aschheim Zondek reaction was negative during the interval. The patient was a twenty-eight year-old woman from whom a hydatid mole was removed January 12 1932. The next day the Aschheim Zondek reaction was definitely positive. The patient was discharged from the hospital on January 23. On February 6 curettage was done because of haemorrhage. The Aschheim-Zondek reaction was then negative. On April 9 curettage was repeated because of bleeding. The histological diagnosis was negative for chorion

epithelioma but the Aschheim Zondek reaction was positive. Two of the five mice showing typical corpora lutea. On April 29 total vaginal extirpation of the uterus with removal of the right adnexa was done. The right tube presented a small nodular swelling which on histological examination was found to be a chorionepithelioma. Aschheim Zondek tests carried out on April 24 May 11 June 18 June 30 and July 21 were all positive. On July 23 a pulmonary metastasis was discovered.

Especially noteworthy in this case was the fact that during the period between the removal of the hydatid mole and the appearance of the chorionepithelioma there was at one time a negative phase in the hormone secretion. From this fact it is apparent that when the removal of a hydatid mole is followed by a negative Aschheim Zondek reaction the urine tests should be repeated at intervals of four weeks for a period of three months. Only when the findings remain negative during that time can the patient be regarded as clinically cured. The author concludes also that when the Aschheim Zondek reaction remains positive longer than four weeks following an operation for chorionepithelioma a recurrence is to be expected.

E. PHILLIPS (G)

many cases there is a marked disproportion between the size of the lesion and the retention produced.

Recently the diagnosis has been facilitated by a combination of urethroscopy and urethrogram, and the surgical treatment has been considerably simplified by electrosurgery. The principal pathologico-anatomical characteristic of the lesions to be emphasized is the usual disproportion between the size of the opening of the diverticulum into the prostatic urethra and the size of the sac. As a rule the orifice is so narrow in proportion to the diverticulum proper that retention and stagnation occur. Therefore treatment must be directed toward widening the orifice. The size of the base or sac of the diverticulum varies from that of a pinhead to that of a prune. The sacs may be single or multiple. Their shape is commonly that of a bunch of grapes, but may be most irregular resembling that of an ostrich plume. Their site and direction may also vary. The diverticulum may be in the median sagittal or transverse plane or between the two. Therefore both front and bilateral profile exposures should be taken in the urethrographic examination.

For satisfactory therapeutic results an exact and complete diagnosis is essential. A single diverticulum remaining ignored and left to persist will result in failure of the treatment. The roentgen examination is carried out best with the use of the radiographic table devised by the author which turns automatically to the right and left without disturbing the patient.

Prostatic diverticula may be congenital or acquired. In the congenital diverticula which are very rare the orifice is ordinarily not constricted as in the acquired diverticula. The acquired type of diverticulum is usually the result of an old chronic prostatitis of gonorrheal origin. Rarely the colon bacillus or enterococcus, and more frequently the staphylococcus, may be the offending organism. An abscess resulting from the inflammation leaves a tiny often microscopic cavity which constitutes the initial stage of the formation of a diverticulum. In some cases the condition may remain stationary at this stage and persist throughout life without causing inconvenience. In others, the period of latency may be terminated after from five to fifteen or more years. Patients suffering from chronic gonorrheal urethritis should be warned of the possibility of late manifestations of a prostatic diverticulum. In a case cited three diverticula remained latent for ten years and then produced sudden evidences of their presence following an attack of dysentery.

The symptoms are both local and general. The local symptoms are disturbances of micturition or the symptoms of a recurring epididymitis. The former are the more common. There may be extreme frequency accompanied by pain and an increase in the number of attacks of vesical irritation. The general symptoms, which are more typical, include those of intoxication and infection profoundly affecting the general health. Fatigue and incapacity for prolonged effort soon lead to disability. In some

cases the symptoms may become acute and alarming. In a case cited there was fever of 40 degrees C. with a marked loss of weight occurring in a period of three weeks.

The author ascribes such symptoms to secondary infection from the urinary tract. The organisms found most frequently are the colon bacillus and enterococcus. The staphylococcus is discovered especially in patients who have suffered from recurring boils or anthrax. Heitz Hoyer uses a urethroscopy with bilateral windows which render it unnecessary to turn the instrument in the urethra.

For the operation he recommends the use of his urethroscope with its three new features, namely three optics two windows, and a flexible rubber terminal branch which is of aid in the prevention of trauma and hemorrhage. For the electrodes, piano wire which is firm but elastic should be used instead of copper as a certain rigidity is needed to enter the narrow prostatic cavities. The terminal plate should be polished and flexible. A stand for adjusting the urethroscopy is necessary. A mixed current should be available in order that the surgeon may use a coagulating or cutting action at will. Epidural anesthesia is best for prostatic operations. In the cases of very nervous patients it may be preceded by an injection of scopolamine and morphine.

The surgical procedure itself depends entirely upon the findings in the particular case. In some cases it may be necessary to perform the operation in two stages, but the author prefers to complete it in one stage if possible. He warns especially against repeated minor procedures as these may predispose to hemorrhage and infection. The patient should be hospitalized for at least five or six days, and if necessary for from ten to fifteen days.

Before the diverticulum itself can be attacked, its urethral orifice must be widened. In cases in which the diverticulum has many and tortuous ramifications the author treats the secondary dilatations in a second stage three, four or five weeks after the first stage. In the use of the electrocautery it must be remembered that secondary cicatrization will result and that therefore a margin of safety must be allowed in the cutting of the tissue.

A permanent catheter should be left in place for at least eight days. In the prevention of secondary hemorrhage and infection Guyon's double curved catheter is of great aid. After removal of the catheter occasional irrigations with silver nitrate will help to remove the excessive scar tissue. The elimination of this tissue may take from four to six weeks, during which period the pain on micturition and the frequency of micturition may persist.

EDWIN S. MOORE.

De Laugre M: End Results of the Treatment of Tuberculous Epididymitis (Suites éloignées du traitement de la tuberculose epididymaire) *J. Chir. Méd. et Chir.*, 1933, XXXV, 377

De Laugre reports a statistical study of the results obtained by different methods of treatment in

tuberculous epididymitis. The treatment is not simple as the condition is usually associated with tuberculous lesions of the bladder prostate kidneys lungs, bones, or joints.

French surgeons usually perform an epididymectomy but some American surgeons prefer total removal of the genital organs on the affected side and German surgeons prefer castration. De Langre discusses the results obtained by (1) medical treatment, (2) radical removal of the genital organs (3) castration, (4) epididymectomy, and (5) ligation of the vas deferens.

In conclusion he states that epididymectomy is the method of choice as it preserves the important internal secretion of the testicle, and should always be done when the tuberculous lesion is confined to the epididymis. Castration should be reserved for cases in which the testicle is extensively involved. Postoperative medical treatment improves the prognosis.

MARSH W. POOLE, M.D.

MISCELLANEOUS

Laetsch, F. A Contribution on Chorionepithelioma in the Male (*Beitrag zum Chorion-Epitheliom des Mannes*) *Roentgenprax* 1933 1 108

Laetsch reports two cases of chorionepithelioma in the male. The first was that of a man twenty-six years of age who had had a swelling of the left testicle for four years. During the last two months the swelling had increased and the patient had had a

cough with red expectoration. Roentgenograms of the lungs showed scattered roundish shadows especially in the middle and at the bases. X ray treatment following operation was without effect. Autopsy disclosed metastases also in the thyroid, brain kidneys, right adrenal liver and small intestine. At first, sarcoma of the testicle was suspected, but histological examination revealed chorionepithelioma. In general, metastases of chorionepithelioma are not sharply circumscribed in the roentgenogram. Metastases of sarcoma tend to be distributed more centrally and those of chorionepithelioma are usually more peripheral than in the case herewith reported. In the first roentgenogram, the nodes were discrete but after three weeks they had become confluent.

The author's second case was that of a boy nine years old who had had a testicular swelling for six months. The swelling gradually increased until it reached the size of a man's fist. Examination revealed also a large tumor in the epigastrium gynecomastia and the secretion of drops of colostrum. The habitus was distinctly feminine. Widespread metastases were found in both lungs the liver and the para aortic lymph nodes. In the roentgenogram of the lungs the pulmonary nodes appeared as round shadows scattered all over, but especially numerous in the lower fields. The pulmonary apices were uninvolved. Operation was not performed and as in the first case roentgen treatment was without effect.

R. MEYER (G)

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Fairbank, H. A. T. Osteochondritis Dissecans.
Brit J Surg 1933 xxi 67

The author defines osteochondritis dissecans as a condition in which a fragment of articular cartilage and subchondral bone becomes separated, partially or completely from typical positions at the ends of certain long bones.

Trauma is a common cause, but a history of trauma is by no means always obtained. The joint most commonly affected is the knee, but similar lesions have been found in the elbow, ankle, and hip and even in the head of a metatarsal. In some cases the condition is bilateral.

The typical situations of the lesions in the various joints are as follows: In the knee, the inner condyle close to the intercondylar notch, in the elbow the capitellum, in the ankle, the trochlear surface of the astragalus, and in the hip, the highest point of the head of the femur. Cases in which the external condyle of the femur was affected have been reported by Balensweig, Delchiel, and Heine, and cases of bilateral lesions of this condyle by Nissen. The author has seen lesions of the external condyle and of the patella. If the fragment is not displaced, the symptoms are those of a mild chronic joint disturbance, such as vague discomfort with persistent or recurrent fluid (both aggravated by violent exercise) weakness, and loss of confidence in the joint.

Most surgeons believe that trauma plays a part in the development of the condition, if only to cause the final complete displacement of the fragment. It is therefore well to consider first, how trauma can occur at the typical spot on the inner condyle. Direct external injury can be eliminated because at the most common site of the lesions the articular surface is well protected in all positions of the joint. The blow or blows must be struck by one of the two other bones forming the joint. According to one theory the patella and according to another the spine of the tibia, is responsible.

The author believes that the tibial spine is responsible. The inner appears to be the larger of the tubercles in most knees. If not in all, and certainly in those affected by osteochondritis dissecans. Several orthopedic surgeons have called attention to what they regarded as excessive size of the inner tubercle in their cases. There are two ways in which this tubercle may be forced against the inner condyle, namely by rotation of the tibia on the femur or of the femur on the tibia, and by an external shearing force driving the tibia inward or the femur outward. In cases with a definite history of trauma it is difficult to obtain a clear account of the accident

but it seems probable that in most cases the factor responsible was rotation. Roemer favors the rotation theory but speaks of the involuntary rotation, i.e. external rotation, which takes place just before extension is completed. In the cadaver he was able to produce lesions of the articular cartilage at the typical site by forced external rotation of the tibia.

In the examination of a number of dissected specimens the author and Blair found that as a rule, impingement of the tibial spine against the inner condyle was produced by internal rotation of the tibia on the femur. In only one of the specimens examined was it evident that external rather than internal rotation of the tibia brought the spine to bear against the condyle. A study of the lateral roentgenograms of affected knees suggested that the amount of flexion present at the moment of rotation must be very small.

The author concludes that the typical lesion is a fracture. He bases this conclusion on the following facts:

1. It occurs most frequently in adolescents and young adults indulging in vigorous pastimes.

2. Typical lesions are seen in roentgenograms and revealed by operation after definite trauma which in some cases is quite recent.

3. A lesion at the typical site may involve the cartilage only, the detached fragment consisting of normal articular cartilage. In such cases there is a definite history of trauma.

4. There is entire absence of inflammatory changes in and about the lesions.

5. The gross appearances when operation is performed early suggest nothing but a simple recent fracture. When sufficient time has elapsed for changes to occur they are only those which would be expected from an effort on the part of the tissues to repair the damage. Exactly similar changes are occasionally found on the more exposed parts of the femoral articular surface, where the traumatic origin of the lesions is never disputed.

6. When the detached fragment is suspended by a vascular pedicle the bone in it is not dead and is not a sequestrum.

7. To explain the occurrence of the lesion in both knees or in the knees of more than one member of a family it is easier to assume the presence of anatomical peculiarities favoring exceptional local trauma than the occurrence of embolism, damage to the blood supply or any other change.

With regard to the treatment the author states that in the absence of symptoms the finding of a typical lesion in a roentgenogram is not a sufficient cause for opening the joint. However it is extremely unlikely that this discovery will be made except in the course of routine roentgen-ray exam-

in a bilateral case. Fairbank has found the lesion unexpectedly on routine roentgen ray examination in cases with a damaged semilunar cartilage. Heistrom advises operation in spite of the absence of symptoms as he believes that if such treatment is not given, osteo-arthritis will develop. In Fairbank's opinion, this late complication cannot be prevented even by early operation.

If the presence of symptoms the joint should always be explored. If, when the joint is opened the articular surface is found to be unbroken but the site of the lesion is clearly indicated by a change in the color or texture of the overlying cartilage or the extent of the lesion is indicated by a groove, an attempt should be made to determine whether the circumscribed area of cartilage is movable or not. If it is movable, it should be excised, together with any loose bone beneath it. If it is not movable, the problem is more difficult. In the author's opinion the condition of the cartilage within the circumference of the lesion should be the determining factor. If the cartilage is definitely soft, sodden and rough it should be excised even if it is unbroken. All loose bone should be removed and the edges of the hole should be carefully bevelled. If the cartilage is almost normal in appearance, if the lesion is only just discernible, and if there is nothing to suggest that a fragment of the bone is loose, the lesion may safely be left alone. If there is any doubt regarding the condition, and particularly if the mobility of the fragment beneath is uncertain, it is wiser to excise the lesion.

If the lesion presents the more usual appearance with the cartilage fractured, but with an unbroken portion holding the fragment more or less in position, the separation should be completed and the fragment removed. The cartilaginous margins of the crater should be carefully bevelled when necessary and any undermined portions removed. If the fragment is free in the joint and the roentgenogram shows the site from which it came, the incision should be planned to allow inspection of the crater as well as removal of the loose body. In all cases the condition of the semilunar cartilage should be determined.

The immediate prognosis and the prognosis for some years to come are undoubtedly good, but the remote prognosis is less favorable as there is reason to believe that osteo-arthritic changes are certain to occur sooner or later. H. EARLE CORNWELL, M.D.

Faltrieri, M.: The Methyl Antigen of Boquet and Nègre in the Treatment of Osteo-Articular Tuberculosis (L'antigène métillo di Boquet et Nègre nella cura della tubercolosi osteo-articolare). *Chir. di organi di movimento* 1933, xviii, 37.

Faltrieri has treated forty seven cases of osteo-articular tuberculosis with the methyl antigen of Boquet and Nègre. As this treatment rarely causes even a slight general or local reaction, it is applicable to ambulatory as well as hospital patients. However, it is contra-indicated in cases with marked pyrexia and advanced tuberculous cachexia.

The methyl antigen has a specific beneficial effect upon tuberculous osteo-articular lesions. It may cause cessation of the activity of the pathological process, subside the fever (70-83 per cent of the cases reviewed), resorption of abscesses (75-54 per cent of the cases reviewed), disappearance of the spinal cord phenomena due to the pressure of abscesses, relief of the pain, regression of the defensive muscular contractions, and the arrest of bone destruction. By favoring healing of the local process it may stop the progress of the deformity. The improvement is evident not only clinically but also on roentgen examination. The roentgenogram shows recalcification, re-appearance of normal bone trabeculae and signs of reparative processes.

The effect of the antigen continues after the treatment is discontinued, probably on account of humoral and tissue immunization set up in the organism. PETER A. ROSE, M.D.

Selvaggi, G. Vertebral Osteomyelitis (L'osteomielite vertebrale). *Ann. ital. di chir.* 1933, xii, 675.

Selvaggi reviews the history of vertebral osteomyelitis and reports two cases. Lannelongue, in 1879 was the first to study the condition. According to statistics, cases of vertebral osteomyelitis constitute from 2 to 6 per cent of all cases of osteomyelitis. Up to 1933 about 200 cases had been published. The mortality decreased from 71.4 per cent in 1896 to 34.5 per cent in 1931.

The author's patients were males fifty and eighteen years of age. In both, the disease followed pneumonia and involved the third and fourth lumbar vertebrae.

In the first case there was a paravertebral abscess with slow compression of the spinal cord causing sensory and motor disturbances in the legs. In the second case the pus reached the epidural space, producing sudden paraplegia, paralysis of the sphincters, and disturbances of sensation. In both cases roentgenograms showed disappearance of the intervertebral disk and in the first case disclosed also a sharp marginal osteophytic shadow. These findings apparently confirm the hypothesis that the primary infection is in the disk. Thickening of the marginal shadow together with destruction of bone are strongly suggestive of osteomyelitis. Both of the author's cases came to operation at a late stage and were fatal.

As a means of determining whether operation is indicated or contra-indicated Selvaggi recommends lumbar puncture above the suspected site of the lesion. A purulent fluid contra-indicates operation. Selvaggi discusses the difficulties of differential diagnosis, the necessity for early diagnosis and active intervention, and the choice of operative measures according to the conditions in the particular case. In cases diagnosed early the results obtained by direct attack on the focus in the bone are in favor of bold and radical operation.

MARY ELIZABETH MORSE, M.D.

Putti V: Clinical Aspects of Degeneration of the Intervertebral Disk (Aspetti clinici della degenerazione del disco intervertebrale) *Chir d'organi di movimento* 1933 xviii, 1

Putti reports ten cases of localized chronic lumbar pain due to primary degeneration of an intervertebral disk. Roentgenological study of this condition shows that narrowing of the intervertebral spaces is constant, but is not symmetrical or equal on both sides. It causes an angulation between the two vertebral surfaces and a localized sharp scoliosis. As it is usually more pronounced anteriorly than posteriorly a kyphosis results. In early cases the kyphosis is slight, but in advanced cases it is more marked. In the earliest lesions the narrowing may be equal throughout the entire joint surface and the vertebral surfaces adjoining the narrowed disk may appear normal.

In the more advanced cases the epiphyseal surfaces are deformed and show evidence of sclerosis which may extend into the spongiosa. The narrowing of the disk permits contact and friction of the two epiphyseal surfaces with resulting marginal thickening and sclerosis of the spongiosa. As far as can be determined from roentgen-ray studies, the narrowing of the disk involves particularly the fibrous or lamellar ring of the disk. The negative shadow of the gelatinous nucleus is outlined fairly well even in advanced cases.

The marginal reaction occurs on the ventral and lateral sides of the vertebral bodies. The lesion occurs most commonly in the upper lumbar region and is limited to a single intervertebral space. In a case in which a lesion of the disk between the first and second lumbar vertebrae was present for five years, the disk between the second and third lumbar vertebrae showed changes, but in another case, in which the narrowing had been present for about ten years, the process remained limited to one disk.

The author's patients included an equal number of males and females. Their ages ranged from thirty-five to sixty years. In one case the symptoms had been present since the patient was nineteen.

One of the first symptoms is pain. As a rule it is mild and localized and is aggravated by motion but not by direct or indirect pressure. It is usually localized to the lumbar region. In only one of the author's cases did it radiate to the lower extremities. Complete relief for months occurs at periodic intervals. During the acute phase the pain is severe and confines the patient to bed or renders the erect posture and walking difficult. Frequently it is not relieved, but accentuated by the horizontal position, although it is almost immediately relieved by immobilization in a plaster cast.

The disease runs a chronic course. It begins with only an apparent cause, passes through phases of pain alternating with periods of quiescence, and tends to become progressively worse. However, the pain and the pathological process remain localized.

Putti discusses the possible causative factors. He believes that the condition is due to trauma.

The treatment indicated is immobilization and active hyperemia. The immobilization should be prolonged. One of the author's patients who has been under observation for five years continues to require immobilization. Spinal fusion may yield good results.

PETER A. ROSE, M.D.

Dodd, H.: Pled Foot or March Foot. *Brit J Surg* 1933 xii, 131

In reviewing the literature on march foot, Dodd cites Morton as having shown that certain feet function at a mechanical disadvantage being structurally weak. Morton described four signs or defects indicative of potential foot trouble which can be diagnosed by roentgen examination. These are:

1. Laxity of the joint between the internal cuneiform bones and between these bones and the scaphoid which results in hypermobility of the first metatarsal.

2. Shortness of the first metatarsal causing overpronation of the foot.

3. Posteriorly located sesamoid bones at the head of the first metatarsal.

4. An enlargement of the shaft of the second metatarsal bone especially in its transverse diameter, which has arisen in response to the increased burden thrown on this bone by an incompetent first metatarsal.

In examining for Morton's four points the roentgenograms of fourteen march feet presented by different orthopedic surgeons, the author found: (1) signs of hypermobility of the first metatarsal in twelve of thirteen feet (2) a short first metatarsal in three cases, (3) posteriorly placed sesamoids in all cases in which an observation was possible (4) thickening of the second metatarsal in thirteen cases of the third metatarsal in seven cases, and of the fourth metatarsal in one case and (5) a marked increase in the density of the outer border of the first metatarsal in all cases. Thus, march foot is most likely to occur in feet that are structurally weak.

The author believes that march foot is a complication of a subacute flat foot occurring in feet that are structurally weak. In such feet, muscular spasm and exhaustion alternate and as the latter supervenes, the stout ligaments of the foot are gradually stretched and direct trauma occurs to the bony skeleton of the foot. The unclamped shock produces effects first in the weakest bones, which include the slender resilient metatarsals.

As flat foot develops, the feet take up the usual pronated-abducted position, pointing outward instead of approximately straight forward. Thus the body weight is no longer carried through a line passing between the first and second metatarsals, parallel with their shafts and distributed squarely on the heads of the five metatarsals, but falls largely in an oblique direction on the inside of the foot, i.e., most on the head of the first metatarsal (if it is normal) next on the head of the second then on the head of the third and to a lesser degree on the heads of the fourth and

5th. If the foot is structurally weak, as appears to be frequently the case in march foot, a hypermobile first metatarsal will roll away from this weight and as a congenitally short metatarsal cannot reach to the ground to carry the strain, the weight must pass primarily to the second metatarsal and in decreasing amounts through the third, fourth and fifth metatarsals.

March foot is probably an auto-traumatic complication of subacute flat foot in a structurally weak foot rather than a separate clinical entity. Among the various diagnoses suggested for it are tenosynovitis, spasm of muscles, periostitis, synovitis, arthritis, rheumatism, and fracture with callus formation. All of these conditions may be factors in its development.

March foot develops insidiously with slowly increasing pain which at first occurs after prolonged excessive effort and later after ordinary exercise. Ultimately, the pain becomes continuous and causes disability. From twenty to forty years ago reports of groups of from fifteen to forty cases were common, but during the last ten years the number of cases recorded has been much smaller.

The swelling appears on the dorsum of the foot. It is usually centered about the shafts of the second and third metatarsals and invades the soft tissues and bone. It scarcely puts on pressure and is tender and slightly reddened. A bony swelling of the shaft of one of the metatarsals usually the second or third becomes palpable several weeks later. This is callus which is usually formed around an oblique or V shaped fracture of the metatarsal shaft at the junction of the middle and distal thirds. Unless march foot is borne in mind the callus may be mistaken for a new growth necessitating amputation.

In the fully developed case the roentgenogram shows a bony swelling with a somewhat fluffy, bulbous outline due to callus, at the junction of the distal and middle thirds of the shaft of the second or third metatarsal or the shafts of both of these bones much less often of the shaft of the fourth or fifth metatarsal, and extremely rarely of that of the first metatarsal. This swelling is around a partial or complete fracture usually without displacement. As recovery progresses, it becomes smaller and more sharply defined. In the early stages there is increased density of the shafts of the metatarsals where the interosseous muscles arise i.e. the second, third, and fourth and the inner border of the fifth. The outer border of the first metatarsal shaft is also dense, but the change is most marked in the shaft of the second or third metatarsal.

According to Jansen, other bulbous swellings may arise about the shafts of the metatarsals. The author has observed slight ones about the shafts of the first phalanges of the second, third, and fourth toes. These are probably due to localized periostitis at the site of attachment of the flexor tendon sheaths.

In the treatment advocated by Dodd the patient is kept in bed until the pain and edema subside the

foot being completely immobilized by plaster in a dorsiflexed and inverted position with a well moulded arch. If necessary the foot is manipulated into this over-corrected position under anesthesia.

When the pain subsides the patient gets up and is carefully fitted with stout shoes or boots which will adequately support the foot. The footwear is supplied with internal wedges to the heel and sole metatarsal bars or if necessary an external iron with an internal T-strap.

The patient is instructed with regard to the toilet and care of the feet and is given a card on which the following rules are printed:

1. Scrub the feet and legs daily in hot water with a soft brush or loofah glove
2. Wear thick stockings or socks and change them frequently
3. Avoid standing
4. Walk with the toes pointing directly forward never outward
5. Wear shoes or boots from the moment of getting out of bed until getting into bed at night
6. Never walk in soft slippers or with the feet protected only by stockings
7. When sitting place the feet up on a chair or couch if possible
8. Practice moving the feet and toes up and down about twelve times before or after each meal when in bed and when riding on a bus or train

The treatment described includes also graduated exercises of the feet and legs to redevelop the lost muscular tone. The patient is not allowed fully to resume his occupation until the muscle power is equal to all ordinary and extraordinary demands likely to be made upon it.

Obesity, varicose veins, visceroptosis, general muscle flabbiness and poor bodily carriage are treated and any septic foci with toxins diminishing muscle tone are removed if possible.

Finally because of the permanent structural weakness of the foot the patient is warned that more consideration of the feet than is usual will always be necessary and that sound, well fitting footwear must be worn.

H. EARLE CONWELL, M.D.

Wiltzer H.: Growth Apophysitis of the Calcaneus. *Calcaneopathia Posterior Adolescentium* (L. apophysite calcaneenne de croissance calcaneopathia posterior adolescentium). *Arch. franco-belges de chir.*, 1937-38 xxxiii, 860

Growth apophysitis of the calcaneus is an entity the characteristics and symptoms of which are now so clear that it need not be confused with other conditions of a similar type. It is a disease of ossification occurring only during the second period of childhood—in girls from seven to sixteen years and in boys from ten to twenty-one years of age.

It is caused by various factors such as over exertion in sport, occupational fatigue, traumatism, marked osteomyelitis, and endocrine disease. It is characterized clinically by pain and swelling and roentgenologically by very evident disturbances of os-

sification in the apophysis. The onset may be sudden or insidious. Besides pain and swelling the symptoms may include contracture, muscular atrophy, sensitivity to pressure, lameness, circumscribed suppuration, and crepitation.

The course is prolonged, with possible remissions of several months' duration. The condition may become bilateral.

In the roentgenological signs two stages may be distinguished, a first stage of decalcification and a second stage of hypercalcification. In the former there is an increase in the density of the apophysis and cartilage and bone shadows appear in the cartilage. The calcaneus shows indentations on the posterior surface, fragmentation, decalcification of the tuberosity and partial rarefaction of the lower third. During the stage of hypercalcification the density of the nucleus is increased.

There are two clinical forms of the condition: (1) the common form, which is most often benign and usually attributed by the patient and the physician to a sprain, neuralgia, or contusion; and (2) the pseudo-infectious acute form, which is usually accompanied by a rise in the local and general temperature, very severe pain, contracture, general prostration and sometimes chills.

In the differential diagnosis it is necessary to rule out tuberculosis, syphilis, osteomyelitis, paramyco-

toma, trauma and certain conditions in the neighboring parts such as subastragular or calcaneocuboid arthritis, bursitis, and tenosynovitis.

As a rule growth apophyitis responds to rest in bed for a few weeks and appropriate general and orthopedic treatment.

General tonic treatment, including the administration of iron, rest in bed, and ultraviolet irradiation, is of great benefit. Bathing for thirty minutes in water containing sea salt and at a temperature of about 35 degrees has been found of value, especially in cases without suppuration. In these cases also Borchardt has obtained good results from surgical removal of the cartilage.

In the suppurative cases, the administration of polyvalent anti-staphylococcus vaccine may be efficient. Surgical treatment consists in removal of the apophysis followed by drainage. In some cases polyglandular organotherapy has given good results.

The orthopedic measures include placing the foot in equinus in a plaster cast. Some surgeons recommend the wearing of high-heeled shoes to relieve traction on the apophysis. The least expensive treatment, that advocated by Zaafer, is the application of a felt band over the heel. Recently Flab devised an apparatus consisting of a right-angled aluminum splint fitting into a raised cork sole, the whole encased in leather. EUGEN S. MOORE.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Janz, G. An Evaluation of the Risks of the Injection Treatment of Varicose Veins (Wie ist die Gefährlichkeit der Varizeninjektionen heute zu beurteilen?) *München med Wchnschr* 1932 II, 3107

Two dangers believed to be associated with the injection treatment of varicose veins are pulmonary embolism and the formation of ulcers difficult to heal. The latter complication is due to faulty technique. Paravenous injection should not occur. Some surgeons maintain that even when a correct technique is employed a reflux may cause serious tissue damage. This may be avoided if pressure is maintained over the site of the injection when the cannula or needle is removed. As the vein must be entirely free from blood, compression should be continued for at least ten minutes after the injection. In Schweden a Clinic an elastic binder is placed over the area for one or two days. Complete absence of blood is necessary in order that the sclerosing solution may attack the vein wall in its full strength. The position of the patient during the injection is of secondary importance. The injection may be performed with the patient in the reclining, sitting or standing position, but a change of position while the needle is in place should be avoided. The best solutions for injection are concentrated solutions of sugar and sodium chloride.

Of several thousand injections, embolism occurred in only 13 and was serious in only 3. When the saphenous vein is ligated the incidence of embolism is increased to from 0.5 to 1.36 per cent. This disposes of the question of preventive ligation of the saphenous vein. The chief factors in the formation of thrombi and emboli are slowing of the blood current, injury to the vessel wall, and changes in the blood itself. In agreement with Fischer, Wachs, and Timmerberg, the author distinguishes between local wound thrombosis, septic thrombosis and spreading distant thrombosis. In the injection treatment of varicose veins only local wound thrombosis caused by the irritating action of the solution on the venous wall must be considered. This is harmless and does not extend to other vessels. In X ray studies made in cases in which salt solution was injected Fischer found that when the solution was washed out from the region of the varices it became greatly diluted. Lampert found that both of the solutions mentioned tended to prevent embolism. Wymer found that as ribs they diminished the clotting function. Accordingly in cases of embolism there must be peculiar conditions particularly a predisposition of the blood to thrombosis, caused by disease or infection. In these cases there is always a spreading thrombosis.

Contra indications to the injection treatment are previous diseases and thrombophlebitis. Varices should be injected only in the cases of otherwise healthy persons. Large, thick veins are not contra indications. After operative treatment the incidence of recurrence ranges from 20 to 40 per cent whereas after injection treatment it ranges from 15 to 30 per cent.

The author strongly recommends injection treatment for varicose veins. He believes that fatal lung embolism is impossible if the proper precautions are taken. He calls attention to the fact that sudden emboli may occur also in untreated cases of varices.

FRANK (Z)

Herrmann, L. G. Syphilitic Peripheral Vascular Diseases. *Am J Syphilis* 1933 XVII, 305

Herrmann states that the importance of syphilis in peripheral vascular disease has never been definitely evaluated although the effect of syphilis on the heart, aorta, and cerebral vessels is well known. Syphilitic changes have been found also in other vessels. Of fifty cases of syphilitic aortitis studied by Saphir they were present in the innominate artery in thirty three, in the carotid artery in twenty nine, in the superior mesenteric artery in ten, in the inferior mesenteric artery in three, in the common iliac artery in ten, in the femoral artery in seven, and in the subclavian artery in fifteen. They consisted of a perivascular infiltration about the vasa vasorum in the adventitia and media with consequent changes in the intima. The observations of Warthin in two cases of peripheral gangrene associated with syphilitic aortitis are cited. Warthin's pathological studies showed that syphilitic aortitis is essentially a disease of the vasa vasorum. The narrowing and obliteration of the vasa cause infarction, degeneration, and fibrosis of the intima and media.

According to Herrmann's experience, syphilitic changes are more common in the tibial arteries and their branches than in the larger arteries of the legs. In the Vascular Clinic of the Cincinnati General Hospital several patients with syphilis were observed who showed vascular disturbances different from those of any form of peripheral vascular disease commonly seen in non-syphilitic patients. The disturbances were of three clinical types, namely angiospastic, endarteritic, and thrombo-arteritic.

The angiospastic type is attributed to chronic irritation of the perivascular plexus of the nerves due to the perivascular inflammation. It is characterized by pain, tingling numbness, cyanosis, coldness and sweating of the involved extremity. It differs from Raynaud's disease in the fact that the pain is constant and severe and not associated with par-

oxymys of vasospasm. It is relieved by anti-syphilitic treatment.

The endarteritic type is the most common form of syphilitic arteritis encountered in clinical practice. It is well known that in the terminal vessels syphilis tends to produce an obliterative endarteritis with hyaline degeneration. This is manifested as an obliterative peripheral arterial disease without evidence of arteriosclerosis. One of the characteristic features is the spontaneous development of an active collateral circulation. Anti-syphilitic treatment will arrest the inflammatory process, but the application of measures for the restoration of an adequate collateral circulation is essential.

The thrombo-arteritic type is also characterized by an obliterative arterial process. Though thrombosis is rare in vascular syphilis, it occurs occasionally. It causes obstruction of major arteries with consequent signs and symptoms of ischemia in the involved extremity. In this condition also the development of an adequate collateral circulation is a feature.

Cases illustrating the various manifestations of syphilis on the peripheral arteries are reported. It is emphasized that although anti-syphilitic treatment stops the active inflammatory process, it cannot restore arterial channels obliterated by the disease. The most hopeful means of restoring circulatory efficiency is the stimulation of an active collateral circulation. For this purpose the use of intermittent negative pressure environment as proposed by Reid and Herrmann has proved most effective.

HERMANN E. PEARSE, M.D.

Reid, M. R., and Herrmann, L. G.: Treatment of Obliterative Vascular Diseases by Means of an Intermittent Negative Pressure Environment. *J Med Cincinnati*, 1933, xiv, 300.

In the majority of instances peripheral vascular disease is due to an obliterative process. Nevertheless, little progress has been made in its treatment. The authors report the use of negative pressure. In this procedure which was used in vascular disease originally by Brauer, the principle of Bier's hyperemia by suction is employed.

The use of negative pressure to produce hyperemia was tested on twelve patients—two with thrombo-angitis obliterans, two with syphilitic arteritis, and eight with arteriosclerosis. The treatment resulted in the relief of pain, the healing of ulcers, and subjective and objective improvement of the peripheral circulation.

The negative pressure is applied to the limb in the elevated position. The extremity is inserted through a rubber cuff into a chamber. By means of a suction pump the pressure in the chamber is slowly reduced to -70 mm. Hg, kept at this level for one minute, and then slowly raised to atmospheric pressure. This cycle of change occupies about five minutes and is repeated from five to ten times at a treatment. The treatments are given twice daily for a period of several months. Positive pressure is never used.

The authors conclude that intermittent negative pressure causes sufficient dilatation of collateral channels to warrant its use in the treatment of obliterative vascular disease. HERMANN E. PEARSE, M.D.

Pearse, H. E., Jr.: Embolectomy for Arterial Embolism of the Extremities. *Ann. Surg.* 1933, xcvi, 17.

Pearse reviews the literature on arterial embolism of the extremities and summarizes the results in 206 cases in which arterial embolectomy was done, including 6 cases of his own.

Fifty-two per cent of the patients subjected to embolectomy died within a month of the operation, but in practically no case could death be attributed to the operative procedure. The chief causes of death were cardiac disease and embolism in vital organs.

From a comparison of the results obtained by operative and non-operative procedures, the author concludes that the best results are certainly to be obtained by early embolectomy. He urges early operation as the prognosis becomes progressively poorer with the lapse of time. In his own cases all operations except 1 were done within six hours of the onset of symptoms. Three were done within less than two hours. After ten hours the results became rapidly worse and after forty-eight hours no successful results were obtained from operation.

Following a review of the symptoms and signs of arterial embolism, the author urges early recognition of the condition and immediate cooperation between the internist and surgeon.

MICHAEL R. REID, M.D.

BLOOD TRANSFUSION

Arutjunjan, M.: The Use of Preserved Blood (Die Verwendung von konserviertem Blut). *Sovetskii zhurnal khimicheskoi meditsiny* 1933, xiv, 33.

The author reviews sixty-five transfusions in which he used preserved blood. The blood was taken from fifty-one donors and administered to fifty-five patients. From the results the conclusion is drawn that preserved blood is effective and retains its physiological and biological properties for a comparatively long time (from five to ten days). The clinical results from the transfusion of the preserved blood were comparable with those of the transfusion of citrated blood. General reaction and temperature fluctuations were no more frequent or severe. The blood was preserved with a citrate salt solution consisting of 0.5 c.c. of sodium citrate and 100 c.c. of physiological sodium chloride solution.

The experiments showed that transportation of preserved blood is possible if the flask is filled to the stopper and is carefully closed and packed. It was found that the blood must be kept at a temperature not exceeding +4 degrees. When this is done, microorganisms entering the blood from the air are prevented from multiplying. Nevertheless, careful studies have demonstrated that blood may be kept also at room temperatures from 15 to 18 degrees C.

In the author's opinion the appearance of the blood (hemolysis, flocculation membrane formation, and cloudiness of the serum) may be used as a criterion of the suitability of the blood for transfusion. According to this criterion, the blood appeared unfit for use in five of the sixty five instances reviewed, and in these instances examination demonstrated bacterial growth.

A. FILATOV (Z)

Vinograd Finkel, F.: The Question of the Contamination of Preserved Blood in the Clinic and in Experiments (Zur Frage ueber die Verunreinigung von konserviertem Blut in der Klinik and im Experiment) *Soveren prebi perdis kroci i general*, 1932 III-IV 50

This report is divided into an experimental and a clinical part. In the first series of experiments, preserved blood was artificially contaminated by a drop of a bacterial suspension (25 000 bacteria). The bactericidal properties of the blood were tested with regard to several strains of staphylococci (staphylococcus albus, aureus, and flavus) to the bacillus coli, and to the bacillus subtilis. In some of the experiments the preserved blood was exposed to accidental contamination by the air. In a second series of experiments the strength of the bactericidal property of the preserved blood was studied experimentally by counting the colonies of bacteria in Petri dishes every twenty four hours for three days after contamination of the blood.

The investigations showed that preserved blood possesses certain bactericidal properties similar to those of fresh blood. As dog blood is inferior in this respect to human blood the findings of experiments on dogs cannot be compared without reservations with those of studies made on human beings. The bactericidal power of preserved blood is often sufficient to kill all bacteria introduced into the blood with air. It was demonstrated that preserved blood does not destroy the infection at once. Living bacteria were detected more often in the first nine hours than on the second or third day after the infection.

Of forty five cases in which preserved blood from one to five days old was transfused and a bacteriological test was made before the transfusion the blood was found to be sterile in forty-one and infected in five. In three of the latter the bacteria were non-pathogenic air bacilli and in two they were cocci. In all the transfusion was performed without complications. The author is of the opinion that micro-organisms of this type entering the blood accidentally are weakened by the bactericidal property of the blood to such a degree that they are easily destroyed by the blood of the patient.

A. FILATOV (Z)

LYMPH GLANDS AND LYMPHATIC VESSELS

Rodrigues, A. and De Souza Pereira A.: New Methods of Studying the Lymphatic System (Novas orientações no estudo do sistema linfático) *Arq de patol* 1931 III 121

In experiments on dogs the authors studied the re-establishment of the lymphatic circulation after ligation of the large vessels of the limbs or neck. They describe their technique of injecting an opaque substance so as to render the lymphatic system visible on roentgen examination and present roentgenograms showing the distribution of the lymphatics.

After either section or ligation the lymphatic circulation tends to become re-established. The reconstruction is more rapid after ligation than after section. The authors agree with Funakata that the collaterals are preformed vessels that have not functioned previously rather than newly formed vessels.

From experiments in which they studied the effect of sympathectomy on the re-establishment of the lymphatic circulation the authors conclude that this operation contributes to the development of the collateral circulation and therefore to the re-establishment of the normal lymphatic circulation.

AUDREY GOSSE MORGAN M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Windfeld P: Contributions to the Knowledge of Postoperative Changes in the Blood (Beiträge zur Kenntnis der postoperativen Blutveränderungen) *Acta chirurg. Scand.* 1933, lxx, Supp. xiv

The investigation reported was undertaken to study certain postoperative changes in the blood that might be related to the formation of thrombi. Windfeld observed a postoperative increase in the platelet count which he considered related to the resorption of wound secretions. There was an increase in the viscosity and a decrease in the serum proteins of the blood. These changes were parallel to the amount of blood lost. An increase in the sedimentation rate was related to an increase in blood fibrinogen and not to the severity of the operation. No essential changes occurred in the coagulation time or the calcium content of the blood. Windfeld concluded that the variations noted could not be expected to be of help in the recognition of a beginning thrombus formation. Howard L. Ait MD

Koenig W: A Proposed Method to Prevent Postoperative Thromboses and Embolism. Comparative Observations on 1,500 Patients Subjected to Operation (Ein Vorschlag zur Vermeidung der postoperativen Thrombose und Embolie. Vergleichende Beobachtung an 1,500 Operationen) *Deutsche med. Wochenschr.* 1933, l, 88.

Koenig has found that the characteristic evidence of the general effect of an operation is injury to the blood platelets which leads to more rapid destruction of the platelets and a decrease in their number. This characteristic effect is produced by the intermediate stages of the destruction of the nuclei of the cells which are disturbed at every operation. The products of nuclear destruction are the only substances that meet all requirements for the development of thrombosis: blood changes, injury to the circulation, and changes in the walls of the vessels. The most important effect of the products of nuclear destruction is the effect on the blood platelets. This effect occurs through the spleen. Substances which cause the spleen to contract or exclude its reticulo-endothelial system prevent these changes in the blood platelets which appear after nuclear destruction.

On the basis of these findings the author has used symphol to prevent thrombosis after operation. As the inhalation of carbon dioxide increases the volume of the circulating blood and causes deeper breathing, he employed carbon dioxide to supplement the symphol and to prevent pneumonia.

For seven days after operation the author's patients are given 20 drops of a 10 per cent solution by

mouth or 1 c.c. subcutaneously 3 times a day and approximately every hour during the same time, several inhalations of carbon dioxide until respiration is definitely increased. By this method sufficient breathing is insured.

The author compared 500 patients treated in this manner with 1,000 other patients, including some with the same diseases who were treated on the same service at different times. Equal numbers of patients with the same conditions, such as appendicitis and gastric carcinoma, for example, were compared. In the cases in which the prophylactic régime was used the incidence of thrombosis and embolism was less than 1 per cent, whereas in those in which the régime was not used, it ranged from 6 to 13 per cent. In this comparison Koenig considered only thromboses and emboli which occurred within the first eighteen days, since after that length of time the effects of the nuclear destruction had ceased. If the late thromboses are considered in addition, the statistics are even more favorable with respect to prophylaxis. The symphol and carbon dioxide caused mild thromboses to disappear in from two to four days. The statistics with respect to pneumonia were also improved by the régime described, the incidence of pneumonia following operation for gastric carcinoma, for example, being decreased from 22.5 to 4.5 per cent. Koenig (2)

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Braine, M. J.: Primary Suture of Traumatic Wounds in Civil Practice (A propos de la suture primitive des plaies accidentelles dans la pratique courante du temps de paix) *Bull. et mém. Soc. nat. de chir.* 1933, lxx, 980.

Braine sounds a warning against the practice of suturing wounds primarily which became common during the war. During the war the chief object was to gain time and get the men back into service as soon as possible. In peace haste is less important.

Primary suture is always associated with risk. It is not necessary to save life, and it very often causes death. It should be performed only by skilled and experienced surgeons. The wound should be thoroughly examined, all foreign bodies and every bit of injured tissue should be removed, and absolute hemostasis should be obtained. The younger generation of surgeons who have read the accounts of the wonderful results obtained with primary suture during the war are apt to perform primary suture routinely and often without the necessary careful revision of the wound. The author cites six cases in which the results were disastrous and knows of many more.

In the discussion of this report MÉTIVIER agreed with the ideas expressed by Braine and said that the Surgical Society should teach that suture of extensive wounds of the soft parts is a difficult and serious operation which should be done only by skilled surgeons.

BRIGER said that good results cannot be expected from primary suture unless the anatomical conditions are such that a free excision can be done for some distance around the wound and perfect asepsis can be obtained.

SAUVÉ said that Braine's criticism was more of men than of method. It is true that primary suture is dangerous unless it is performed with the greatest care by skilled surgeons and the length of time that has elapsed since the wound was inflicted is taken into consideration. Up to the fifth or sixth hour there is not much growth of bacteria in the wound. After the eleventh hour suture is dangerous. The suture should be followed by careful bacteriological examinations. This was the custom during the war, but is neglected by many hospitals in peace time.

MOUTOUZOU stressed the importance of impressing on young surgeons the necessity for great care in the treatment of wounds and the danger of suture unless such care is exercised. From the war literature the public has gained the idea that wounds should be sutured and it sometimes requires courage on the part of the young surgeon to refuse suture.

MOCQUOT said that there are considerable differences between typical war wounds and wounds sustained in civil life. The tracks of bullets are generally quite limited and circumscribed, whereas in wounds sustained in civil life, such as those resulting from automobile accidents, the involvement is apt to be much more extensive and irregular and the complete removal of bruised tissue is difficult. Moreover persons with wounds incurred in civil life are apt to be older than, and not in such good condition as, young soldiers.

SORREL stated that young surgeons should be taught that the suture of a wound is a serious operation, and that it is not safe to suture after having merely applied iodine or some other antiseptic.

LENOIRANT agreed with Braine that the hasty and careless suturing of wounds is very dangerous. He stated that suturing should not be done until after methodical and complete excision of all injured tissue. This excision is a long and difficult operation which requires experience and an accurate knowledge of anatomy. Lenoirant agreed also that civil wounds are generally more extensive and more complex than ordinary war wounds, and that careful bacteriological control is apt to be neglected in civil hospitals. Because of these facts he believes it better to adhere to the safer method of cleansing the wound, extracting foreign bodies removing injured tissue and dressing without suture. He stated that the method of secondary suture is an excellent one which seems to be almost forgotten. While it is less brilliant than primary suture, it is much safer.

AUDREY GOSSE MORGAN M D

ANÆSTHESIA

Delagenière Y: A Comparative Study of Different Kinds of Anæsthesia Based on 21 000 Observations (Étude comparée des différentes modes d'anesthésie d'après 21,000 observations) *Bull. et mém. Soc. nat. de chir.* 1932 LVIII, 1523

Delagenière reviews 21 000 anæsthesias of which records were kept by his father Henry Delagenière or himself in the thirty seven year period from 1895 to 1932. The time at which the anæsthesias were induced, the type of anæsthetic used, and the mortality are shown in a table.

The figures indicate that operative mortality does not depend upon the type of anæsthesia used. In the thirteenth, fourteenth and fifteenth thousand anæsthesias reviewed, which were induced at a time when local anæsthesia was being used with increased frequency, the operative mortality was less than 5 per cent. However local anæsthesia was not then employed for major operations on the stomach or abdomen and when the operative mortality increased later with an increase in the number of major operations performed by Henry Delagenière, the extensive temporary adoption of spinal or local anæsthesia did not decrease the operative mortality.

In the first five years of the period reviewed, Henry Delagenière preferred ether whereas in the next twelve years he preferred chloroform. Later he employed a mixture of chloroform and ether. Subsequently he abandoned this for Schleich's mixture and after 1928 employed the latter almost exclusively. The use of ethyl chloride, which was at first very limited, was tripled after 1924. Today ethyl chloride is employed for one-fifth of the general anæsthesias induced at Le Mans. The author believes it is an important factor in the improvement of operative results.

Spinal anæsthesia was used frequently during the years from 1912 to 1913 but its inconveniences and lack of true advantages led to its progressive abandonment. Ten years later, when new anæsthetics suitable for spinal anæsthesia were discovered it returned to favor but later it was again progressively abandoned. At the end of his professional career Henry Delagenière condemned it, and the author under the influence of his training in neurology has abandoned it entirely.

In the period from 1921 to 1924, local anæsthesia was tried by Henry Delagenière for major abdominal surgery especially operations on the stomach. He employed it either alone or combined with several whiffs of chloroform and ether. The results compared with those of general anæsthesia led him to reject it and to employ only a mixture of chloroform and ether or Schleich's mixture for abdominal surgery.

Rectal anæsthesia induced with ether and oil, the most recent type of anæsthesia, is being used with increasing frequency. It may be employed for all long and serious operations not performed on the abdomen—interventions on the central nervous system.

tem, the neck, the breast the lungs, the chest, and the extremities.

The author concludes that general anesthesia induced judiciously with the Schleich mixture or ethyl chloride or with ether given by rectum is the anesthesia of choice provided it is induced by an expert anesthetist.

BARY who read this report to the Society reviewed the anesthetics induced for 3,831 operations performed by himself and his associates. Of these, 3,227 (78.8 per cent) were general, 480 (16.0 per cent) were local, and 128 (4.3 per cent) were spinal. The only death attributable to the anesthesia occurred in a case in which spinal anesthesia was induced with perocain.

Bary emphasizes that one of the chief requisites of any type of anesthesia is safety. He states that when a search is made for a substance to take the place of inhalation anesthetics, it is necessary to take into consideration both their inconveniences and their dangers—pulmonary, hepatic, and renal complications. Pulmonary complications are as frequent after operations performed under local anesthesia as after those performed under general anesthesia. There are no anesthetics which are entirely local in their effects for when any anesthetic is introduced into the body it becomes diffused and eliminated. While general anesthetics are theoretically toxic to the kidneys they have the advantage of being eliminated chiefly by the respiratory tract whereas local anesthetics are eliminated chiefly by the urinary tract. The various anesthetics differ in their nature, their toxicity, and their affinity for certain tissues. As compared with the other types of anesthesia reviewed, general inhalation anesthesia has at least three advantages. It induces a truly general anesthesia, which includes loss of consciousness. It is progressive and strictly proportional to the length and importance of the operation and it can be stopped immediately.

KILLOON SEKID MD

Specht, K. Rausch, Brief and Induction Anesthesia Induced With Evipan-Sodium (Rausch-Kurz und Einleitungsnarkose mit Evipan-Natrium). *Zentralbl f Chir* 1935 p. 247

Evipan-sodium is given intravenously in a 10 per cent solution. It is rapidly broken down in the body and has a broad threshold of anesthesia. The sensory and reflex centers are rapidly excluded whereas respiration and circulation are only slightly affected. The author has used evipan-sodium in 100 cases. No preanesthetic was given. As in avertin anesthesia the dosage depends on various factors such as the patient's body weight, age, sex, constitution and illness. The dosage indicated according to age and sex and expressed in cubic centimeters per kilogram of body weight is shown in the table.

In the cases of cachectic, anemic, icteric, and obese patients, from 1 to 2 c.c.m. are subtracted from the full dose, whereas in the cases of thin, resistant patients and patients accustomed to anesthetics,

Age	Males		Females	
	Strong	Weak	Strong	Weak
10-15	0.16	0.15	0.15	0.14
15-25	0.25	0.14	0.14	0.13
25-40	0.14	0.13	0.12	0.1
40-55	0.13	0.11	0.11	0.11
55-65	0.12	0.11	0.11	0.10
65-75	0.11	0.10	0.10	0.09
Over 75	0.10	0.09	0.09	0.08

the total dose is increased from 1 to 2 c.c.m. The greatest total dose is 10 c.c.m. In general, from 5 to 10 c.c.m. are given. After the patient is sound asleep the injection is discontinued. The injection may be prolonged if necessary. Each of the first 4 c.c.m. should be injected in fifteen seconds and each of the rest in ten seconds. The injection time therefore varies from one to two minutes. Anesthesia results rapidly sometimes with deep yawning and some times with mild tremor of the muscles, but never with spasms or marked excitation. It lasts for from ten to fifteen minutes, usually ten minutes. At the end of that time the patient is often wide awake, but in a third of the cases there is an after-sleep of from fifteen to thirty minutes. There is no period of excitation and usually no post-anesthetic vomiting or other unpleasant phenomena.

Besides its use for rauch and brief anesthesia, evipan-sodium may be employed as a preliminary anesthetic before the administration of ether for more prolonged operations. Definite ether excitation then occurs, but is not so marked as when ether is used alone. In many cases the respiration is shallower and more superficial. The blood pressure drops from 90 to 70 mm. but after from five to ten minutes returns to normal. The pulse rate is somewhat increased. There are no accidents and no late after effects.

WORMAN (2)

Carmona, L.: The Behavior of Certain Components of the Blood Plasma in Chloroform, Ether and Ethylchloroform Anesthesia. (Il comportamento di alcuni componenti del plasma sanguigno nella cloroformo, eteroformo, e nella eteroformo-cloroformica). *Ann. Ital di Chir* 1935, 22, 457

Although researches on the effects of chloroform and ether anesthesia on the organism have been very numerous, practically none of them has dealt with the effects of anesthesia of these types on the components of the blood plasma. Following a brief résumé of the results of chemical and morphological studies of the blood in chloroform anesthesia Carmona reports experimental researches which he carried out on rabbits with regard to the total nitrogen, fibrinogen, and non-protein nitrogen following both single and repeated periods of chloroform, ether and chloroform-ether anesthesia each lasting fifteen minutes. The rabbits were kept on a constant régime and three preliminary tests were made at ten-day intervals for each constituent. The anesthesia was continued for half an hour and repeated on four successive days.

The results, presented in tabular form show that these three types of anaesthesia cause more or less notable modifications in the total nitrogen, fibrinogen, and non-protein nitrogen. The fluctuations of the total nitrogen are irregular in all but are much more marked in anaesthesia induced with chloroform alone or with chloroform and ether than in anaesthesia induced with ether alone. Fibrinogen tends to diminish in ether anaesthesia and to increase in chloroform anaesthesia and shows wider variations in chloroform and chloroform-ether anaesthesia than in ether anaesthesia. The protein nitrogen rises considerably after the first period of chloroform and chloroform-ether anaesthesia but after repeated administrations tends to return to its normal value. In ether anaesthesia it is increased in some cases and decreased in others but the changes are smaller less rapid, and of longer duration than in chloroform anaesthesia.

MARY ELIZABETH MORSE, M D

Halton, J: *Rehalational Anaesthesia A Method of Utilizing the Recent Advances in Anaesthetic Administration. Brit M J., 1933 1 1097*

In recent years the induction of anaesthesia and the apparatus used for it have been greatly im-

proved. However the apparatus still has objectionable features. The author has therefore developed a technique between the open drop and the complicated apparatus method. He calls it rehalational anaesthesia because it holds a place between perhalation and rebreathing into a bag. In its simplest form the apparatus consists of a small cylinder of oxygen and a J size carbon dioxide sparklet strapped together from which tubes are brought to a Y piece whence another tube leads the gases into the mask. A 4-oz ether drop bottle with a Bellamy Gardner dropper and a modified Ogston mask. In the induction of anaesthesia carbon dioxide is allowed to flow in. This deepens respiration so that more of the anaesthetic is absorbed.

The advantages of the author's technique are, briefly as follows:

- 1 The ether vapor is partially rebreathed and is warmed by the patient's own efforts.
- 2 The induction of the anaesthesia is simplified and rendered less uncomfortable.
- 3 The maintenance of the anaesthesia is smooth.
- 4 The incidence of postoperative complications is diminished.

GEORGE R McCLURE M D

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Masia, A.: Clinical and Roentgen Study of Congenital Syphilis. Four Unusual Cases of Late Congenital Syphilis. (Contributo clinico-radiologico allo studio della lue congenita. Osservazioni cliniche rare nella lue congenita tardiva). *Riforma med.* 1933, xlix, 5.

In the last eight years the author has made clinical and roentgen studies of about eighty cases of congenital syphilis. In this article he reports in detail four cases which he regards as rather unusual. Roentgen examinations were made of the heart and vascular system in these cases, but showed nothing particularly abnormal.

The first case was that of a woman thirty years of age who had ulcerated gummata of the cervix. At the age of six years she had nodular gummata of the soft palate and uvula and at the age of nineteen years she had two tumors of the frontal bone which were attributed to congenital syphilis and disappeared under antisyphilitic treatment. This case was unusual because ulcerated gummata of the cervix are uncommon in late congenital syphilis, and because the atheromata remained localized in the external thesa, bones, and skin. There were no signs of visceral syphilis. The patient had a child thirteen years of age which showed no signs of syphilis.

The second case was that of a child ten years old who presented multiple gummata of the neck, the root of the nose, and the soft palate, and congenital anophthalmos from syphilis.

The third case was that of a woman twenty-two years of age who presented imbecility from syphilitic meningo-encephalitis. At birth, there was a bullous eruption on the palms of her hands and the soles of her feet and soon after birth she had convulsions. She had been mentally defective since birth, and at the age of seven years suddenly became totally deaf. The author believes it probable that she had syphilitic meningitis during intra-uterine life. Under antisyphilitic treatment her general condition greatly improved, but sight and hearing were not benefited.

The fourth case was that of a woman twenty-two years of age who was suffering from inflammation of the frontal, ethmoid, and left maxillary sinuses. She had had chronic sinusitis since the age of seventeen. The Wassermann reaction was strongly positive. The condition was greatly improved by specific treatment.

The author emphasizes the importance of syphilis as a cause of inflammation of the nasal sinuses. This was recognized by Fournier.

ANDREW GOSN MORGAN M.D.

Nuernberger, L.: The Resolutions of the German Society for the Study of Inheritance Concerning the Problem of Late Injuries from the Roentgen Rays and Their Consequences With Regard to Irradiation Therapy. (Die Entscheidung der deutschen Gesellschaft fuer Vererbungslehre zur Frage der Spätschädigung durch Röntgenstrahlen und ihre Folgen fuer die Strahlentherapie). *Strahlentherapie*, 1932, xiv, 700.

The author discusses the conclusion of the German Society for the Study of Inheritance and the German Eugenic Society that children conceived after the cessation of roentgen sterility may be injured in their germ plasma. As this conclusion may have both legal and social results, it is of importance for roentgenologists and gynecologists to recognize the possibilities.

With regard to the criminal law aspect, the author cites the German law that when an abnormal child is born after the termination of roentgen sterility and the physician is sued for bodily injury the outcome of the suit depends upon whether the induction of the temporary roentgen sterility is regarded by law as malpractice. Malpractice may be punished by imprisonment up to three years. According to the decision of the two societies, the physician may be sued also according to civil law as the conditions necessary for liability for malpractice may be assumed by the court. As the results of the legal decision may be very important, the author warns especially all roentgenologists and gynecologists against inducing a temporary roentgen sterility. As the viewpoint of the law has been changed since the conclusion cited, he believes that when an abnormal child is born following conception soon after a therapeutic irradiation it will be essential in the future for the roentgenologist to protect himself by obtaining a written statement to the effect that, before the irradiation, he advised the woman of the danger of early conception.

In the second part of the article the author discusses briefly the possible social results of conception and birth following roentgen sterility.

In conclusion he states, as he has done previously that the occurrence of late injury from the roentgen rays has not yet been proved. WASSERMANN (G)

RADIUM

Stahel, E., Simon, S., and Johner, W.: The Clinical Importance of Secondary Beta Rays in Radium Treatment. (Importance clinique des rayons bêta secondaires en curiethérapie). *Acta radiol.* 1933, xiv, 217.

The authors believe that there is a tendency to over-estimate the importance of secondary rays.

The object of this article is to show theoretically that the importance of secondary rays differs materially according to whether α rays or gamma rays are used. In the use of α rays the practical importance of the secondary corpuscular rays is negligible while that of the undulatory secondary rays increases rapidly with the atomic weight of the filter. In the case of gamma rays, all filters are practically equal so far as secondary undulatory rays are concerned although some influence may be exerted by the filter on the secondary corpuscular irradiation.

In photographic experiments and photometric measurements undertaken to ascertain the influence of primary filtration it was found that filters of medium atomic weight emitted a minimal quantity of secondary beta rays. When considerable primary filtration was used the importance of the beta irradiation emitted by the heavy metals diminished and occasionally became even less than that of bodies of low atomic weight. The methods of biological verification were (1) demonstration of the harmlessness of secondary irradiation as regards cutaneous erythema and the conjunctiva of the eye, and (2) a study of the effect of the secondary beta rays on *Drosophila* eggs.

The juxta-cutaneous application of metallic plates of varying atomic weight did not in any way influence the degree of cutaneous reaction produced by a homogeneous irradiation. When filters of medium atomic weight were used the mortality of *Drosophila* eggs killed was reduced to the minimum.

From the point of view of therapy the experimental results lead to the conclusion that the use of secondary filters for transcutaneous irradiations is unnecessary and that for intratumoral irradiation, secondary filters of medium atomic weight (nickel or silver) are to be recommended. EDITH S. BLOOM.

Whitman, W. G. Some Observations of the Effects of Radium Irradiation on Tissue Cultures. *Am. J. Cancer* 1933 xvii, 931

The object of the experiments reported was to study the effect of radium irradiation on normal chicken fibroblasts and compare the effects of irradiation on tumor cells with its effects on macrophages in the same cultures using as a basis for the comparison the change in the number of mitotic figures in the first twenty-four hours following the irradiation.

The fibroblasts from subcutaneous tissue of six and seven-day chick embryos were cultivated in a described solution. Cultures of varying ages were irradiated, but twenty-four hour to forty-eight hour cultures were the most suitable. For studies of mitosis, the tumor cells from Walker rat sarcoma No. 338 were used. These cells were cultivated in chicken plasma and irradiated forty-eight hours after they were explanted. The staining methods used are described in detail. The radium emanation was enclosed in a glass bulb contained in a thin horizontal brass cylinder 6 mm. in diameter. In addition a brass plate 0.5 mm. thick was used for filtration. Cover-slips of soda glass 0.085 mm. thick were em-

ployed. The cultures were placed above and below the filters with the cover slips resting against the filters. Cultures and controls were kept in an incubator, experimental cultures being transferred to a second incubator for irradiation.

Fibroblasts were given exposures varying from 5 to 1,800 mc. hr. Essentially the same individual cellular changes took place regardless of the amount of irradiation the difference being one of quantity rather than of quality. The emanation bulbs varied from 20 to 450 mc. in strength. Cells which were in motion at the onset of the irradiation complete their division. No arrest of this process was noted in any of the cells studied. However beta rays from an enormously greater amount of radium would probably have arrested mitosis already under way on account of the sudden application of damaging agents of very great intensity. Early abnormal changes consisted in the formation of pyknotic mitotic figures and, as the cultures aged an increasing number of cells showing mitotic deformities. During the period of division some of the cells broke down.

It seems fairly definite that the irradiation of cultures has a deleterious effect on the chromosomes themselves. Abnormalities described are probably eventually if not immediately inimical to the life of the cell or at least to the continuance of the normal cell cycle. No special irregularities of behavior of the nucleoli were noted. The nucleoli simply disappear in the early stage of mitosis and re-appear or re-form in the daughter cells.

Cultures of the rat sarcoma were characterized by large malignant cells with comparatively large nuclei, numerous small normal macrophages, and varying numbers of lymphocytes. These sarcoma cells predominate in most cultures of the age used in these experiments. They are much larger than the macrophages and are easily distinguishable. The cultures were in good condition at the time of irradiation and were fixed at one, three, six, and twenty-four hours after irradiation. The dosages used are shown in tables. Cytological variations were so common in non irradiated cultures that it was impossible to differentiate specific effects due to irradiation. Changing of the culture media resulted in the destruction of many of the sarcoma cells.

The effect of irradiation on the number of mitoses of the malignant cells as compared with its effect on the number of normal macrophage mitoses in the same cultures and in the number of non irradiated control cultures was next determined. The results are shown in detail in tables and by graphs. They demonstrate that the number of mitoses of the normal macrophages was proportionally more reduced by irradiation than the number of mitoses of malignant cells. The percentage of initial fall in the mitotic count for all normal cells was greater for all three doses than was the initial fall in mitotic count for the tumor cells. On the other hand the normal cells started to recover after the first hour whereas the tumor cells continued to fall until the third hour. The mitotic count for normal cells shows a gradual

decline after the sixth hour except in the case of the 50 mc.-hr. dosage, while the mitotic count for tumor cells continues to increase or maintains the sixth-hour level. In general shape, the curves for normal cells resemble those found by Kemp and Juul in their studies of the effect of irradiation on fibroblasts.

In summarizing the author states that the normal fibroblasts show a characteristic fall and recovery in mitotic count after irradiation, depending on the dosage and the length of the exposure. The cultures were exposed only to gamma rays. Cells in division at the onset of the irradiation proceeded in normal fashion. Abnormal mitotic figures were found shortly after the irradiation. Scattered, aberrant, and lagging chromosomes were also characteristic of the irradiated cultures. No damage to mitochondria or nucleoli was observed. Rat sarcoma exposed to 5, 16 and 50 mc.-hrs. showed similar morphological changes, but such changes occurred also in non irradiated cultures. Irradiated tumor cultures appeared unable to live if the medium was changed after the irradiation. The normal cells appeared to be more affected by these dosages than the tumor cells. The number of mitoses was proportionally more reduced by the irradiation in the normal cells than in the malignant cells. The percentage initial fall in the mitotic count was greater for all three days for normal cells than for malignant cells.

A. JAMES LARSEN M D

MISCELLANEOUS

Paterson R. Classification of Tumors in Relation to Radio-sensitivity *Brit. J. Radiol.* 913 v, 218.

Different tissues react differently to the same amounts of irradiation. The basis of all irradiation treatment of tumors is the sensitivity of tumors to irradiation. Therapists have a general idea of sensitivity but it is empirical. The purpose of this article is to present a tentative classification of tumors according to their average radio-sensitivity. Paterson says that it would be of extreme value if we could consider the treatment of whole groups of tumors instead of merely that of single tumors. While irradiation includes all forms of radiant energy Paterson discusses only X rays and gamma rays. He says that sensitivity is difficult to define. The absolute measurement of the sensitivity of a tumor would be the physical measurement of the lethal dose of irradiation for that tumor. This is not yet practical. The term "relative sensitivity" means the relationship of the lethal dose for a particular tumor to the lethal dose for some normal tissue such as the skin. By "lethal dose" is meant the amount of irradiation which causes permanent disappearance of the tumor.

Paterson divides tumors into the following four groups: (1) radio-sensitive growths, the lethal dose for which is less than that for the skin, (2) epitheliomas, or moderately sensitive growths, the lethal dose for which is close to that for the skin, (3) adenocarcinomas, which are moderately resistant and (4) radio-resistant growths.

In one of the two chief methods of employing irradiation a given amount of irradiation is delivered to a considerable volume of both normal and abnormal tissue indiscriminately by external irradiation. In the other method, a given amount of irradiation is built up within a sharply limited or localized area. In the first method the X rays and the radium pack or bomb are the principal agents employed. By such a method it is impossible to deliver to the tumor bearing area an irradiation intensity appreciably higher than that which can be tolerated by the skin. The procedure is therefore a "skin limited" method. Localized irradiation with an intensity sharply falling off at the periphery is achieved by the use of radium internally or in close apposition to the growth. By multiple cross fire it is possible to build up within a limited area an irradiation of higher intensity than the overlying skin can endure. In the treatment of tumors of high sensitivity such a method is inefficient.

In the author's first group of tumors are included a comparatively large number of sensitive neoplasms, of which the best examples are the lymphosarcoma and the nontreated rodent ulcer. However it is believed to be safer to carry the treatment up to the limits of tolerance, thereby exceeding the lethal dose by a satisfactory margin as this is less serious than underdosing. True epithelial tumors require a higher intensity of irradiation. Lethal dosage lies in the region of the lethal dose for skin. To produce such intensities by external irradiation alone without undue damage to tissues is difficult or impossible in the majority of cases. Often the tumor bed has a lower relative sensitivity than the tumor and therefore is able to tolerate intensities which are sufficient to destroy the growth. Tumors belonging to this group may be attacked by localized irradiation which depends chiefly on the use of radium rays. Those of the former group may be dealt with favorably by external irradiation. When the tumor bed is complex, as in the oesophagus, or sensitive as in the lung, the maximum dose which the bed will tolerate becomes less and the possibilities of therapy are greatly limited. For example, the mucous membrane and muscular structures of the tongue are comparatively resistant, whereas a similar tumor in the glands of the neck cannot be treated successfully by any present-day method of irradiation because application of the necessary dosage is rendered difficult by the skin and the proximity of vital structures.

The second group of tumors in the author's classification includes epithelial tumors of the cervix, skin, lip, and breast.

The tumors of the third group the adenocarcinoma, react somewhat unsatisfactorily to irradiation therapy. High intensities are required to destroy them entirely. Success is not attained when the tumor bed is resistant, as in carcinoma of the body of the uterus. In general, surgical treatment seems to be preferable to irradiation methods.

The fourth group of tumors includes the fibrosarcoma, the hyaline sarcoma, and tumors more resist-

not than the bed in which they lie. However, even in these tumors temporary resolution may be obtained by irradiation. The administration of repeated small doses of irradiation, called by Ewing "growth-restraint treatment" is often of value in lessening the growth or causing it to become more benign.

Sofar the factors relating to sensitivity have been intrinsic or pathological and histological in nature. Extrinsic factors may cause either an increase or a decrease in sensitivity. These factors are shown in a table. Chief among them are poor nutrition, sepsis, and previous irradiation. Sensitivity is influenced favorably by optimum duration of the treatment. In mouth tumors this factor lies between seven and ten days. The results of the injection of various substances, such as lead and glucose, in an attempt to increase the sensitivity of tumors are doubtful. Also

doubtful is the value of pressure on the skin during X ray treatment. Attempts to increase the sensitivity of a tumor by increasing the rate of its growth are associated with risk although they may be sound theoretically. In experiments on cancer bearing mice, Mellanby brought about a definite acceleration of the tumor growth by feeding fresh liver.

In conclusion Paterson says that research on radiosensitivity should be directed to determining (1) accurate criteria for the exact pathological classification of tumors in relation to radiosensitivity (2) a method for the physical determination of the exact quantity of irradiation delivered to the cell and absorbed by the cell (3) the exact lethal dose for each type of tumor and (4) methods of delivering the lethal dose for each type of tumor.

A. JAMES LARKIN M D

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Parodi, G: Familial Achondroplasia and Its Inheritance (Dell'achondroplasia familiare a della sua ereditarietà) *Riv Ital di Ginec* 1935, xv 10.

The author reports three cases of familial achondroplasia occurring in three successive generations and reviews cases of achondroplasia reported in the literature to support his theory that the condition is hereditary and transmitted exactly according to the mendelian laws. He believes that the dystrophic character is recessive and the normal character is dominant. According to this conception, achondroplasia may remain latent for many generations and appear unexpectedly in the progeny of apparently normal individuals.

The various theories of the cause of achondroplasia—toxic, infective, hormonal, amniotic, and racial—are reviewed and statistics based on cases collected from the literature are presented.

A. Louis ROSE, M.D.

Kretzner, W: A Case of Hemophilioidia (Ein Fall von Hemophilioidia) *Deutsche Zeitschr f Chir* 1935 xxxviii 774.

Hemophilioidia is one of the rarer hemorrhagic diatheses which occur during the age of puberty in males and females and are often first manifested by bleeding from the nose which is difficult to control. Other manifestations of hemophilioidia are conditions resembling states of collapse which are not relieved by drugs acting on the heart.

In the case reported by the author the blood count revealed a decrease in the erythrocytes to 3 million and an increase in the leucocytes to 30,000. The coagulation time of the blood was retarded. The history indicated alternate periods of decline and recuperation. Frequently the periods of decline followed slight bleedings which were not sufficient to explain the seriousness of the condition. The aggravation was therefore ascribed to a kind of hemolytic crisis. After three blood transfusions, which were administered during phases of collapse, convalescence occurred slowly with improvement in the condition of the blood. In the author's opinion the transfusions were beneficial not only because they replaced the blood lost, but also because they supplied normal blood with all of the constituents required by the body.

KRONE (Z)

Lauwers, E.: Intra Arterial Injections in Cancer (Recherches sur les injections intra-arterielles dans le cancer) *Rev. belges d. sc. méd.* 1935 v 377.

The treatment of cancer with metals is reviewed. In order to avoid the two extremes of ineffectiveness

and injury by such treatment the author devised the method of injecting metals directly into the regional arteries. To be effective the metal must be retained in the tumor tissue. Lauwers found that intra-tumoral retention could be obtained by injecting metals in suspension. The fine particles passed through the capillaries of the normal tissue and lodged in the small vessels at the periphery of the tumor. From there they passed into the tumor tissue. A 10 per cent suspension of cobalt oxide in distilled water was used. Ehrlich believes that cobalt has cancericidal properties. As it is black, it can readily be seen in the tissues. Later Lauwers supplemented the cobalt oxide treatment with increasing doses of thallium salts.

Malignant glands, which could not be reached by this method, were reached through the lymphatics by giving subcutaneous injections of a fine emulsion of thallium oleate in the vicinity of the glands.

The author reports ten cases in which this method of treatment was used. The immediate result was a remarkable retrogression of the tumor. It is too early to draw conclusions regarding the late results. Such conclusions must be delayed at least five years. The retrogression of the tumors was doubtless due partly to ischemia, but the ischemia was accompanied by general mobilization of phagocytes and a considerable increase of the connective tissue trabeculae around the tumor. The author has never seen cellular reactions comparable to those brought about by irradiation, but in several cases a sudden breaking down of the cancer tissue and necrosis of the glands occurred.

While Lauwers does not believe that the metals used have a specific cancer-destroying action, he regards the method as of great value since, by means of it toxic drugs can be brought into immediate contact with the cancer cells without causing injury to the patient.

AUDREY GOSS MORGAN, M.D.

Hiltz, A.: Results of Operative and Irradiation Treatment of Malignant Tumors Based on Twenty Years Observation at the Berlin University Surgical Clinic and the Roentgen-Radium Institute of the Clinic. A Report on 8,800 Cases: Statistics on Successful Treatment and Indications for Treatment (Die Erfolge der operativen und der Bestrahlungsbehandlung bei bösartigen Geschwülden auf Grund von 20 Jahren Beobachtungen an der Berliner Chirurgischen Universitätsklinik und dem Roentgen-Radiuminstitut der Klinik. Bericht ueber 8,800 Faelle, Erfolgsstatistik und Leitlinien zur Behandlung) *Zentralbl. f. Chir.* 1935 p. 2635.

In order to increase the frequency of cure in cases of carcinoma it is necessary to determine what cases have been truly healed clinically and the means by

which this result was attained. Only methods which have achieved statistically demonstrable permanent cures can be generally recommended. The statistics herewith presented are based on the entire malignant tumor material of an institution which uses operative as well as irradiation treatment. Tumors of all groups, not only surgical, but also skin and gynecological tumors, were treated. The author summarizes the reports presented at the 3 last sessions of the German Surgical Society which dealt with the results of the treatment of sarcoma and of internal and external carcinoma in the last twenty years, a period when irradiation was used in addition to, or instead of operation. The total number of cases treated during this period was approximately 5 500. The types of tumors are shown in Table I.

TABLE I—TYPES OF TUMORS

Tumor	Period	Cases
Five carcinomas	1910-1911	850
Carcinoma of the female breast	1910-1911	1,806
Carcinoma of mucous membranes and internal		
gastrointestinal organs	1914-1915	1,48
benign and tumors of sarcomatous nature.	1914-1915	1,003
Total		5,537

Ninety two per cent of the cases of sarcoma and 66 per cent of the cases of carcinoma are reported. The percentage of successful results was determined from the number of patients who survived for five years or longer and the number who were treated five or more years previously. Cases not followed up and cases of death from intercurrent diseases or old age during the first five years were counted as failures. The calculated percentage of cures is therefore the minimum figure. The percentage of deaths due to causes other than malignancy may be determined by referring to the mortality of the general population at the average age of the patients treated. The incidence of successful results must have been somewhat higher than that calculated, since among the cases that were not followed up some permanent cures may be assumed. Only in cases of skin cancer is it possible with sufficient certainty and (because of the not-infrequent long survival even in untreated cases) necessary to base the statistics on the number of patients remaining free from symptoms after five years as well as the number surviving after that length of time. The absolute number of patients who survived for five years or more and the incidence of successful results in the cases treated five or more years ago are summarized in Tables II, III and IV.

In the cases treated by operation the primary mortality (death within four weeks after the operation) was only 1.47 per cent in those of carcinoma of the skin and 2.6 per cent in those of carcinoma of the female breast. In cases of sarcoma it was 12.1 per cent, and in those of carcinoma of the mucous membranes and internal organs it was 24.5 per cent. The total average mortality for all of the malignant tumors was 9.75 per cent.

On the basis of this large number of cases which were under observation for a long period of time and represent the results of surgical and irradiation treat-

TABLE II—CASES WITH SURVIVAL OF FIVE OR MORE YEARS

Condition	Opera- tion	Irradia- tion	Total	Per cent
Sarcoma and sarcomatous degeneration				
Soft tissues.	43	1	164	8.9
Bones.	0	3	10	30.3
Total	67	15	14	21.5
Internal carcinoma				
Respiratory tract.	6	6	18	3.4
Urinary tract	6	6	23.6	
Digestive tract.	80	71	151.7	
Genital tract.	10	6	16	1.1
Total	93	90	197	30.4
Carcinoma of skin				
Face.	80	804	234	63.6
Trunk, extremities, lips, ear				
Carcinoma.	4	22	46	40.4
Total	14	26	130	60.8
Carcinoma of female breast				
Operable	15	7	197	35.4
Inoperable		4	4	0.7
Total	5	170	201	33.3
Grand total	180	653	1,043	23.7

Not including 22 cases operated upon before 1912 which are grouped with the cases of recurrence.

TABLE III—CASES OF SKIN CANCER WITH FREEDOM FROM SYMPTOMS FOR FIVE OR MORE YEARS

	Opera- tion	Irradia- tion	Total	Per cent
Face cancer.	5	17	160	25.0
Cancer of trunk, extremities, lips, carcinoma.	7	6	23	3.2
Total	90	123	183	33.4

TABLE IV—INCIDENCE OF FIVE YEAR SURVIVAL IN CASES TREATED BY PRIMARY OPERATION, PRIMARY IRRADIATION AND PROPHYLACTIC IRRADIATION*

	Total number treated	Five-year cures No.	Per cent of total number
Sarcoma and sarcomatous degeneration			
Primary operation.	395	238	23.4
Prophylactic irradiation.	82	3	30.0
Primary irradiation.	201	50	24.0
Carcinoma of mucous membranes and internal organs			
Primary radical operation.	60	160	23.1
Prophylactic irradiation.	14	16	20.0
Primary irradiation.	122	21	9.3
Carcinoma of skin			
Primary operation			
Survival.	161	164	6.8
Freedom from symptoms.	161	94	30.0
Primary irradiation			
Survival.	158	15	60.0
Freedom from symptoms	158	01	33.6
Prophylactic irradiation			
Survival.	64	1	45.8
Freedom from symptoms	64	6	23.0
Carcinoma of female breast			
Primary operation.	656	200	30.5
Prophylactic irradiation.	183	97	33.0
Primary irradiation.	65	4	0.1
All malignant growths	1,001	650	37.7
Primary operation.	143	35	20.8
Prophylactic irradiation.	160	130	20.8
Primary irradiation.	1,002	1,043	13.7
Total			

*Most of the cases treated by primary irradiation were inoperable, and in most of those given prophylactic irradiation the prognosis was regarded as unfavorable at the time of operation.

ment, 4 important questions on the treatment of carcinoma as well as the indications for it are answered as follows

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